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PRODUCING REFINING ENGINEERING MARKETING

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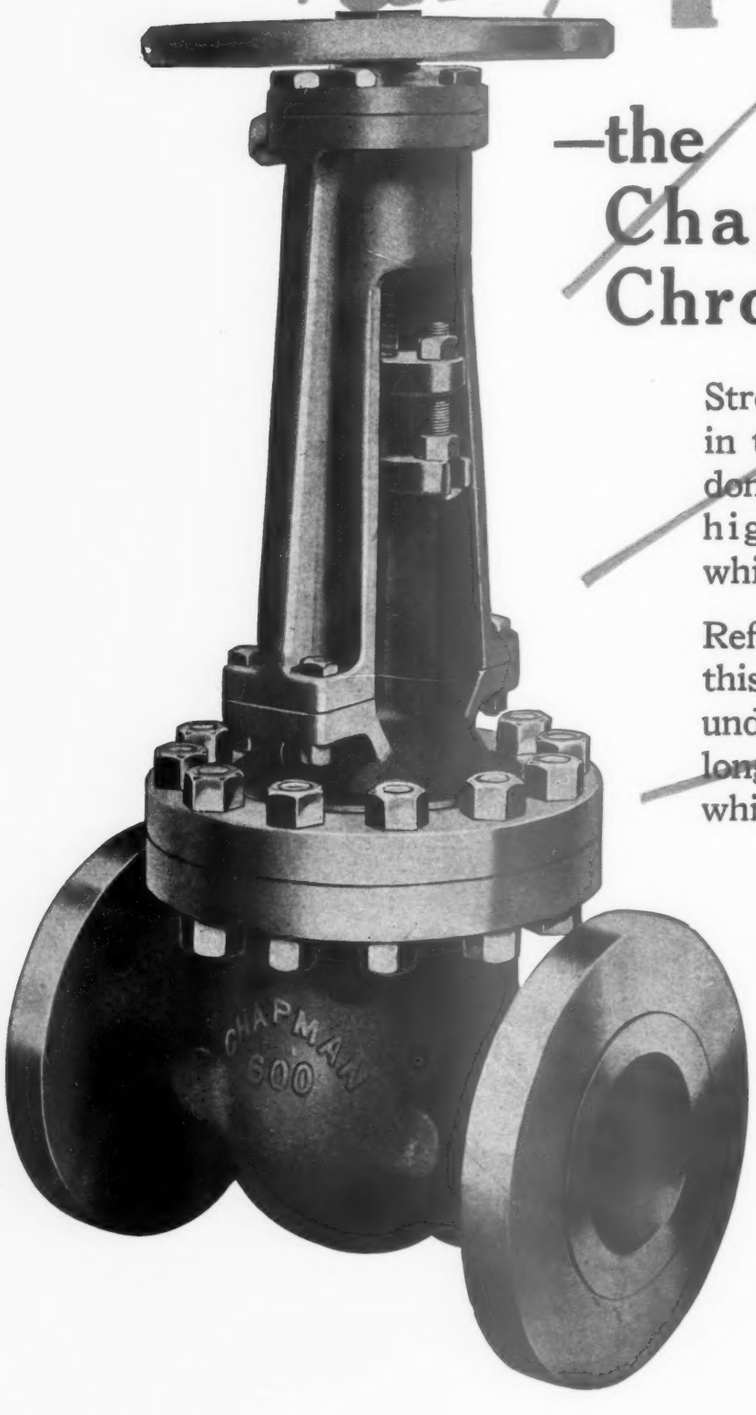

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Production Situation Becoming Acute

Highest daily average estimated total production in 1928, week ended Dec. 29, 2,585,844 bbls. Lowest in 1928, May 19, 2,338,241 bbls.

Steadily Mounting Output With No Immediate Prospect of Decline Intensifies Interest in Conservation Measures

By Andrew M. Rowley

Highest daily average estimated light oil production in 1928, week ended Dec. 29, 2,158,134 bbls. Lowest in 1928, Mar. 3, 1,927,713 bbls.

A glance at the adjoining table and the graph below will show immediately the reason for the agitation for some action upon the part of the petroleum industry to curb steadily mounting production and to solve the problem of overproduction which is constantly becoming more acute. Not only has the production of crude oil broken all previous records but all indications point to further increases in output, especially from California and Oklahoma. The Santa Fe Springs Field in California is registering substantial gains while the Mission and Maud areas in Oklahoma will be more important factors in the production column during the latter part of next month.

There can be no getting away from the fact no substantial decrease in production of crude oil can be expected for some time and also that before any material decline is recorded, further increases in output will be registered. In other words, the peak has not been reached. With production already far above that required by available markets and a still greater quantity assured, the industry is confronted with the possibility of crude oil price reductions or the putting into effect quickly of measures which will force the curtailment of production to market requirements.

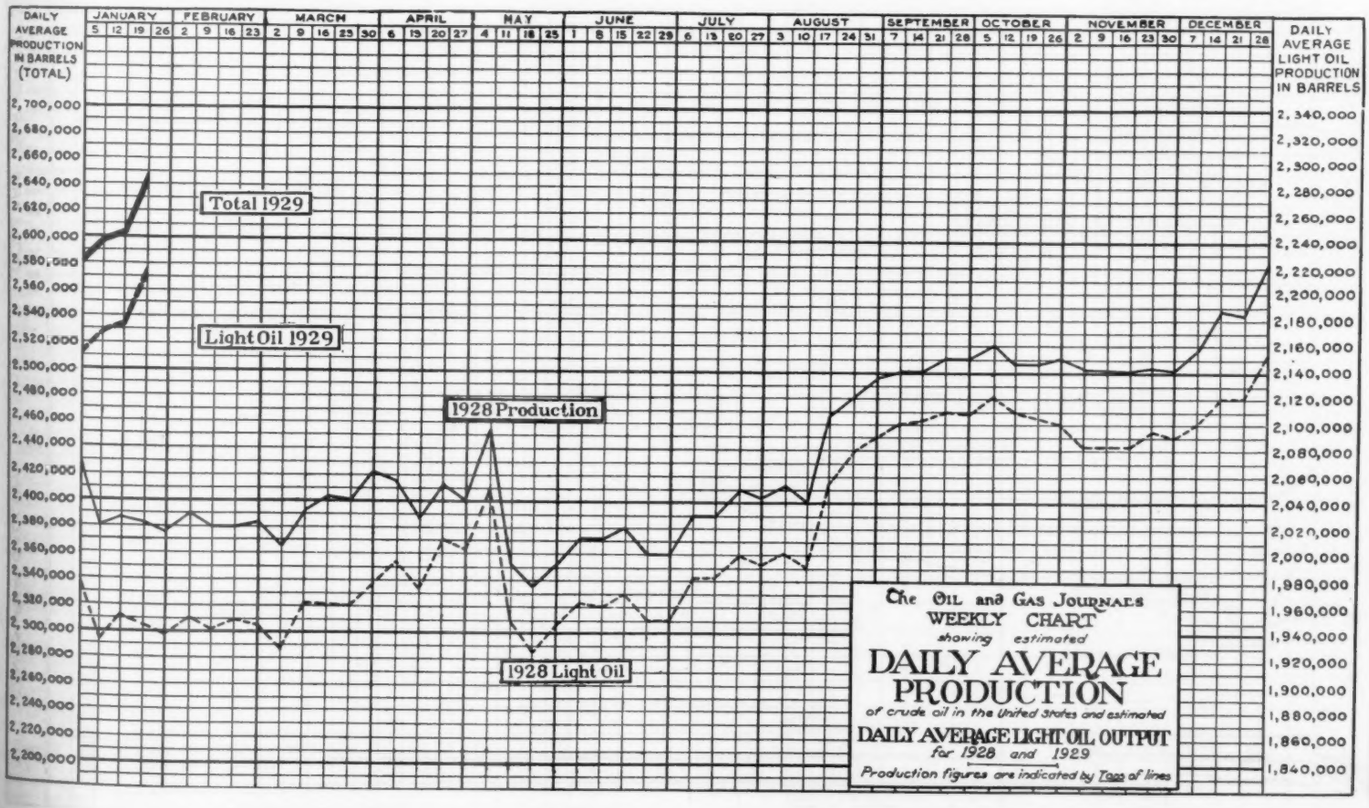
In this connection the following statement by a big investment banker is interesting: "My belief is that the oil industry is facing the most prosperous era in its history and the formation of the export association is but the first step in that direction. The next step, on which a special committee is working, is the proration of output by the producers in the various oil areas throughout the country. If an agreement is reached on this matter nothing can prevent a real boom for the industry. For the first time in its history the oil industry is doing big constructive things in a big way."

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended January 19, and a comparison with the previous week follows:

	Jan. 19		Jan. 12	
	Light	Heavy	Light	Heavy
Oklahoma—				
Tonkawa	12,215		11,270	
Burbank	23,285		24,220	
Other Osage Fields	26,730		26,435	
St. Louis-Pearson	131,280		133,815	
Cushing and Shamrock	21,070		20,920	
Bristow	19,095		19,465	
Allen	27,285		26,485	
Seminole	288,265		279,715	
Northern Miscellaneous	116,210		116,985	
Southern Fields	58,070		58,810	
Total Oklahoma	723,505		718,120	
West Texas—				
Hendricks	172,221		166,045	
Yates	74,762		73,228	
Remainder	122,057		119,731	
Total West Texas	369,040		359,004	
North Louisiana	30,445	5,840	30,635	6,020
Arkansas	26,490	51,760	27,275	51,885
North Central Texas	138,377		138,891	
Texas Panhandle	59,700		58,595	
East Central Texas	21,551		22,150	
Kansas	97,110		97,240	
Total Mid-Continent Area	1,466,218	57,600	1,451,910	57,905
Gulf Coast		139,150		137,902
Southwest Texas		45,971		45,953
Eastern	113,000		114,000	
Rocky Mountain Area	74,591		73,192	
California—				
Santa Fe Springs	155,000		132,000	
Long Beach	183,000		182,500	
Torrance	2,000	13,500	2,000	13,500
Huntington Beach	48,000		48,500	
Elwood	18,000		14,500	
Inglewood	16,000	11,000	16,000	11,000
Ventura Avenue	53,500		49,500	
Seal Beach	28,000		28,500	
Remainder of State	59,000	166,000	60,000	166,000
Total California	562,500	190,500	533,500	190,500
Total United States	2,216,309	433,221	2,172,602	432,260
Grand Total		2,649,530		2,604,862

→ **Total Increase, 44,668 Bbls.; Light Oil Increase, 43,707 Bbls.** ←



Gasoline Prices Steady in Oklahoma

Natural Gasoline Continues to Advance. Neutral Prices Lower. Refiners Close Fuel Oil Contracts With Railroads

By C. O. Willson

The firmness in the Oklahoma (Group 3) gasoline market noted in these columns a week ago continued during the past week. In the case of refinery gasoline prices for the most part were steady during the week and in a few instances the sellers felt justified in advancing their prices one-eighth to one-quarter cent for both domestic and export movement.

Natural gasolines substantiated the predictions made a week ago and advanced steadily. Additional purchases by three of the largest manufacturers in the Mid-Continent Field were reflected in price advances and on Tuesday a price of 6¼ cents had been established for Grade AA. This was a 1-cent advance over the low price early in the month. The purchases which totaled around 1,000 cars for delivery over the remainder of January and the first 15 days of February apparently have absorbed all the excess material that will be available for the next three weeks. Due to this fact many of the trade are predicting that for the next 30 days a price of 6 cents or better will be maintained for Grade AA which is the principal grade sold both on the spot market and on contracts.

Kerosene also was firm during the week. The low cold test fuel oils are generally termed "firm" to "strong" by the trade and the latter part of last week at least two large refiners in Oklahoma advanced their prices on high-gravity fuels, gas oils and straw distillates. Following the lead of one of the largest manufacturers in the State there was a general reduction in neutral oils. Cylinder stocks on the other hand continued strong and average prices are slightly higher on bright stocks and the better grades of steam refined oils.

REFINED MARKET BAROMETER

Reductions in gasoline tank wagon and service station prices in the eastern area of the United States during the past few days furnished additional evidence of a general weakness in the refinery gasoline market. The latter prices held in some refining areas of the Mid-Continent, but for the domestic market as a unit, refinery prices are lower than a week ago. Natural gasolines continued to advance in the Mid-Continent and are strong in California. No price changes of general importance developed in kerosene, although reports from the eastern refinery groups indicate a slow movement in both the export and domestic markets. The reduction in California heavy crude oils is expected to have some effect on coastal fuel oil markets, although no price changes were announced during the past week. Furnace oils continue in strong demand and prices are firm. Neutral oils were reduced in the Mid-Continent and scattered reductions on neutral oils and cylinder stocks became effective in eastern areas. Wax prices were lowered in several refining areas.

Mid-Continent—Refinery gasoline prices in Oklahoma, Kansas and North Texas unchanged and lower in Arkansas and North Louisiana. Natural gasolines higher in all areas. Kerosene prices firm. Good movement of furnace oil distillates. Satisfactory movement of low cold test fuel oils. Neutral oils price reduced. Cylinder stocks strong.

East Coast—Lower gasoline tank wagon prices disturb refinery prices and domestic prices lowered. Bright stock prices lowered. Paraffin wax prices lower. Fuel oil well maintained. Good demand for gas oil from gas companies. Diesel oil demand strong.

California—Lower crude prices point to further reductions in fuel oil prices. Gasolines weak.

Chicago—Gasolines soft with light jobber demand. Strong furnace oil demand. Fuel oil demand steady. Lubs quiet.

Pennsylvania—Gasoline and kerosene quiet. Steady demand for bright stocks and steam refined cylinder stocks.

Gulf Coast—Better demand for neutral oils. Prices firm.

Refinery Gasolines

Steadiness characterized the Oklahoma refinery gasolines despite the fact that weakness and lower prices were reported in many other refining areas. The explanation lies mainly in the export situation. As reported a week ago substantial quantities of the higher gravity gasolines have been purchased for both spot and future delivery. Additional purchases were made during the past week and it is now estimated this export business totals around 15,000,000 gallons. The delivery is spread over the next 90 days with some of the spot material already moved from the refineries. The purchases will remove material from the market which otherwise would probably have been thrown on the spot market as distress material. The greater part of this 15,000,000 gallons was placed with refiners in North Texas but it has direct bearing on the entire Mid-Continent market particularly Oklahoma and Kansas.

North Texas Situation

Developments over the past year have not improved the position of North Texas refiners from a marketing standpoint. They are now completely surrounded by other refining areas which have surplus material over local requirements so that the North Texas operators are compelled to look to export channels or distant domestic markets to absorb practically all of their gasoline. Up until the past year or two North Texas had been able to move large quantities of gasoline to West Texas customers but the many refineries now operating in that area have taken that outlet.

Due to this condition market weakness in gasoline and kerosene has generally been apparent in North Texas before it was in other areas. Some of the refiners in that area have contracted for all their high gravity gasoline over the next 30 to 90 days and it is certain that very little material will be offered in competition with other Mid-Continent refiners in the immediate future. To this extent at least the export purchases are a favorable development for the entire Mid-Continent Field. The kerosene situation in North Texas is similar. The refiners are sold up over the remainder of January and a few plants will have no kerosene to offer before the middle

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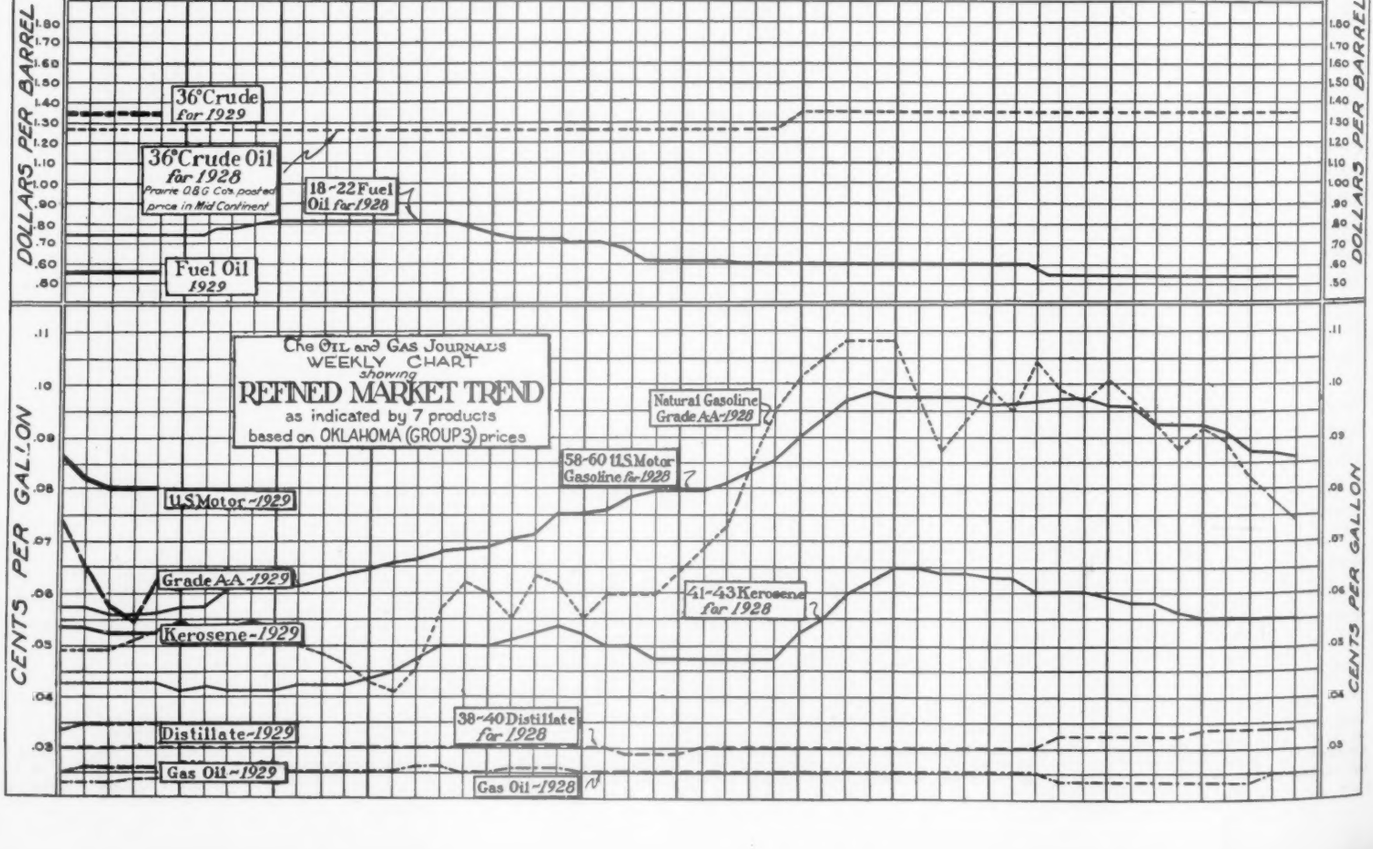


To Discuss Legislation at Open Forum

Meetings Planned To Be Held Prior To Session of A.P.I. Directors in St. Louis. Attorney Criticizes One Bill

Open forums will be held in the principal oil centers of Oklahoma and Kansas between now and February 11 for a full, free and frank discussion of proposed measures to be presented to the legislatures of different oil-producing states covering voluntary and compulsory development of new oil pools. Mass meetings scheduled to be held in Independence, Kans., and Tulsa to discuss the proposed bills have been cancelled, the open forums being decided upon in their place.

No decisions favoring or opposing legislation will be made at any of the forums, the purpose of these meetings being simply to enlighten oil producers on the different points involved in the proposed measures and to explain any sections about which there may be doubt or indecision. Men who have made a close study of the subject will speak at these forums and will endeavor to answer all questions propounded during the meetings.

On February 11, the board of directors of the American Petroleum Institute will meet in St. Louis and will hear a report of the national committee appointed recently by President E. B. Reeser to consider conditions in the industry. It is understood the principal part of the report of this committee will deal with proposed legislation. Following the meeting of the board of directors of the Institute, it seems entirely probable committees will be named in the different oil-producing states to perfect bills for presentation to the legislatures.

Reeser Suggests Forum

Decision to cancel the mass meetings scheduled and to hold the open forums in different towns throughout Oklahoma and Kansas was made by J. C. Denton, president of the Oklahoma-Kansas Division of the Mid-Continent Oil and Gas Association after the receipt of the following letter from Mr. Reeser, president of the Institute:

"The national committee recently appointed to consider conditions in the industry throughout the United States, and to suggest a remedy for stabilizing the industry, will report to the directors of the American Petroleum Institute at St. Louis on February 11.

"Probably the most important phase of the committee's report will be on the question of state legislation. It is, therefore, very important that sufficient time should be available to the industry to fully inform itself with regard to the necessity for, and the form of state legislation.

"With this in view, I respectfully request that the mass meetings called under the direction of your executive committee be deferred until after February 11, and in the meantime it is suggested that an open forum be held in the various centers of the oil districts in Kansas and Oklahoma.

Few matters have aroused such intense interest throughout the petroleum industry as the report of the Conservation Committee of the Mineral Section of the American Bar Association and the two measures presented by that committee as a basis for state legislation. This report and the two proposed measures were published in full in The Oil and Gas Journal of January 3. Philip Kates, an attorney of Tulsa, who has made a study of the petroleum business, has prepared the following article in regard to one of the bills:

BY PHILIP KATES

The report of the Conservation Committee of the Mineral Section of the American Bar Association presents one bill, to be enacted by the oil-producing states, which would compel the unit operation of "new" fields, as provided by law.

Stripped of all legal verbiage, and as the very heart of the proposed law we find the idea that oil and gas in place, is the common property of the surface owners. The discussion of the validity of that idea must be reserved for the future. But, assuming it to be sound, would the condition proposed in the new law provide for a just as well as an "orderly" supply of crude oil, and natural gas?

"Should a majority of the operators in a new oil and gas pool," says Section 3 of the proposed act, ". . . agree in writing upon a co-operative plan for the development and operation of said pool . . . they may cause one of their number to . . . file . . . a petition . . . for the compulsory operative development and operation of each separate holding in said pool, in accordance with said plan."

A new pool, within the meaning of the act, is defined in Section 1, as "an oil and gas pool wherein the initial discovery in paying quantities occurs after this act shall go into effect."

When a well has been drilled in, after the passage of the act, and oil or gas is found in paying quantities, the limits of that pool must be determined, not by drilling, but immediately, by expert testimony.

One can readily visualize the hearing upon the determination of the limits. Everyone with adjacent acreage will seek to be included in the pool, except the poor operator who has risked his capital to discover it. And the more that are included, the greater will be the majority petitioning for unit operation.

The operator who has drilled in the discovery well may need all the production to pay his debts, but he must wait upon the determination of the adjacent lease owners, who may or who may not eventually have oil under their parcels. An oil or gas lease, from which the owner may produce to the capacity of his wells, now has a definite collateral value at the bank. If that production is subject to the determination of an indefinite number of leaseholders, it will have none. One can see the whole credit structure of the independent operator crumble on the passage of such an act.

A large company, with widespread production, with refineries and pipe lines and distributing stations, may be able, for a time, to stand up; but at the first breath the independent operator has gone.

There is no doubt that an "orderly response to the economic needs of the country" should be the aim of any industry. But common prudence demands that its credit structure should not be impaired in any attempt by legislation to bring about changed conditions.

Says Law Should Be Uniform

Besides, the law should be uniform in the oil producing states. Apparently it is built up upon what is popularly thought to be the underlying theory of the Supreme Court in the Ohio Oil Co. case, in which a statute of Indiana was upheld, preventing the waste of gas, upon the ground that such waste might destroy the property of other land owners in the common pool. Without discussing that point, it may very seriously be questioned whether such a doctrine would be upheld in a case arising in Texas, where separate ownership of oil and gas in place, is the base of the oil and gas law of that State.

Discussion of the proposed law, not only by independent operators, but by their lawyers, should be full and complete before they are asked to pass upon it. And it should be examined from all angles before it is even presented to a state legislature for consideration.

Since Colonel Drake drilled the first oil well, it has been the base of the credit structure of the oil producing business, that one who discovers a pool has a right to get out all the oil he can as quickly as possible. Whether this is or is not economically sound is a matter that cannot be disposed of lightly. Nor can the legal rights built upon the practice of the industry be disposed of without consideration.

The independent producer does not appear to be represented on the committee, unless it be by Frederick C. Proctor, who does not concur in the report.

Yet a meeting of producers was called to meet at Tulsa and one to meet at Independence to consider and to pass on the bill.

Yet the report is made to the Mineral Section of the American Bar Association, which cannot consider it till next summer.

Certainly the independent producers should demand further time before they are asked to pass on the bill. And all of its possibilities should be fearlessly and fully discussed.

No more important question is before the industry at this time. And the pages of its trade journals, and the meetings of its associations should furnish the platforms for these discussions.

Neither the eminence of the counsel who drew the bill, nor the power of the companies behind it, should prevent or shorten this discussion.

NO DEFINITE FORM OF LEGISLATION HAS BEEN RECOMMENDED—E. B. REESER

By E. B. REESER

President, American Petroleum Institute and the Barnsdall Corp.

In reply to the article of Mr. Philip Kates in this issue of The Oil and Gas Journal, may I suggest that the American Bar Association, the American Petroleum Institute, the Mid-Continent Oil and Gas Association, or any other association—and no individual—insofar as I have learned, has approved or recommended any definite form of legislation.

President Coolidge, realizing the importance of conserving our natural resources, appointed the Oil Conservation Board. As a result of this admitted seriousness of the petroleum industry, long and exhaustive study has been given to the subject. The Mineral Section of American Bar Association was invited to appoint a committee to suggest legislation which would be constitutional, as well as helpful to the industry. This committee, after careful study, suggested a form which might help to cure some of the industry's ills. Many leaders in the industry believe this suggestion points to relief. It has been urged that the oil industry consider carefully, the suggestions offered, and if not satisfactory, to propose something better.

We believe it imperative to the future prosperity of everyone engaged in the business to do all that can be done to conserve our petroleum resources. If the plan proposed is not desired, most of us are willing to accept something in its place.

CRITICIZED POINTS IN MEASURE EXPLAINED BY LEGAL AUTHORITY

By a Leading Petroleum Attorney

An advance copy of the article written by Philip Kates for this number of The Oil and Gas Journal has had my hurried attention. First of all, constructive criticism of the report and the two bills suggested by the Mineral Section Committee of the American Bar Association should be welcomed by everyone interested in the petroleum industry. By that means alone may the industry determine for itself whether or not further state legislation is necessary to stabilize the business and should the decision be in the affirmative, the form the legislation should take. In the nature of things, any specific proposal for legislation should be practical, adapted to the leasing and producing conditions of the particular state; it should stand the test of constitutionality and it should have the general support of the industry. In these circumstances, papers of the character prepared by Mr. Kates perform a distinct service.

There are three questions raised by Mr. Kates which justify comment. In the first place, complaint is made that the proposed statute for compulsory co-operative development does not define with certainty the limits of the oil pool to be affected; that serious detriment will follow from the inclusion of lands that should not be included or from the exclusion of lands that should be included. Let us look at the proposal in its practical bearing. The statute submitted by the committee, which I understand was by way of suggestion only, contemplates compulsory co-operative development under at least two conditions: First, where a structure has been discovered but no production obtained. Secondly, where a structure has been but partially developed. In either event, the proposed law proceeds upon the theory that the boundaries of the pool shall be determined in the first instance by the best evidence obtainable and then provision is made for the reduction or enlarging of the pool as originally determined as development therein requires.

The whole theory of this law is that it shall apply to a single oil pool and that the plan for the development of the same shall apply only to such lands as from the best evidence obtainable are properly a part of that pool.

In further answer to the criticism made in this paper, any lawyer who studies the bill in all of its provisions will see at once that its constitutionality depends upon its operation being limited to a single oil and gas pool. The second point made by Mr. Kates which deserves attention is that

(Continued on Page 147)

Magnetometer Survey of Arkansas

Believed Many Favorable Areas May Be Discovered Only by the Use of Geophysical Methods of Wildcatting

By L. Spraragen

The production of oil in Arkansas dates back to its discovery in that State in 1921. At the present time there are approximately eight large producing areas with over 4,500 wells producing about 93,000 bbls. daily; of this amount approximately 80,000 bbls. are supplied from the Smackover Field.

With the more general use of geophysical methods it is only natural that their aid should be enlisted in the search for new structures in Arkansas as well as other states.

In this connection the following paragraph is taken from a paper by L. P. Teas, "Review of Petroleum Development in Arkansas and North Louisiana in 1927," presented at the New York meeting of the Petroleum Division of the A.I.M.E., February, 1928.

"Although some of the apparently best structures in Arkansas and Louisiana are being tested without commercial production in the Trinity, we must remember that a number of favorable places have not been drilled. The great unconformity between the Upper and Lower Cretaceous also permits of many favorable areas being hidden, where discovery may be possible only by the use of geophysical methods or even by random drilling."

Plate 1 shows a general magnetometer map of the State of Arkansas prepared on the basis of vertical magnetic intensity values computed from the readings taken by the United States Coast and Geodetic Magnetic Survey for this State.

It will be noted that there are two values of intensity given for each station, one value being the one computed from the United States Coast and Geodetic readings and the other value marked with an X being the value of vertical magnetic intensity corrected by the writer for latitude and longitude. The reference base for this correction was taken at longitude 95w, latitude 40n. This same reference point was used for each of the articles already published so that it will be possible to assemble all maps on one plate if desirable.

It has also been pointed out in a previous article that if there were no unusual magnetic disturbance the lines of equal magnetic intensity as shown in Plate 1 would be practically parallel and without distortions, having a general northwest-southeast direction. Any unusual disturbance beneath the earth's crust will manifest itself by a distortion of the lines of equal intensity and as has been explained in a previous section, a distortion toward the south or west represents a magnetic anticline while a distortion to the north or east represents a magnetic syncline.

Plate 1 shows several of these disturbances. There appears to be a magnetic anticline running northeast and southwest in the vicinity of Van Buren and Fort Smith.

Another very pronounced magnetometer high in the vicinity of Clarksville, Johnson County, extending north towards Huntsville, Madison County, and south to Danville, Yell County; a minor disturbance also associated with this high has an axis which passes through Paris, Logan County, Boonville, Logan County, Waldron, Scott County.

Another large magnetic anticlinal structure appears to extend from Perryville, Perry County, south through Benton, Saline County, east of Malvern, Hot Spring County, through Sparkman, Dallas County, Camden, Ouachita County, and west of El Dorado, Union County.

Another magnetic anticline extends from Mountainview, Stone County, southwest through Clinton, Van Buren County.

Still another passes through Batesville, Independence County, and Des Arc, Prairie County.

A seventh indication of a high trend is found in the vicinity of Brinkley, Monroe County, Clarendon, Monroe County, Stuttgart, Arkansas County, to Pine Bluff, Jefferson County.

Another high trend of great prominence extends from Star City, Lincoln County, south through Monticello, Drew County, and Hamburg, Ashley County, into the State of Louisiana.

Other high trends are indicated passing through Marion, Crittenden County, in a southwest direction, also one in the vicinity of Rosedale, in the State of Mississippi.

Low Trends

More or less associated with the high trends just enumerated are several pronounced lows or magnetic synclines.

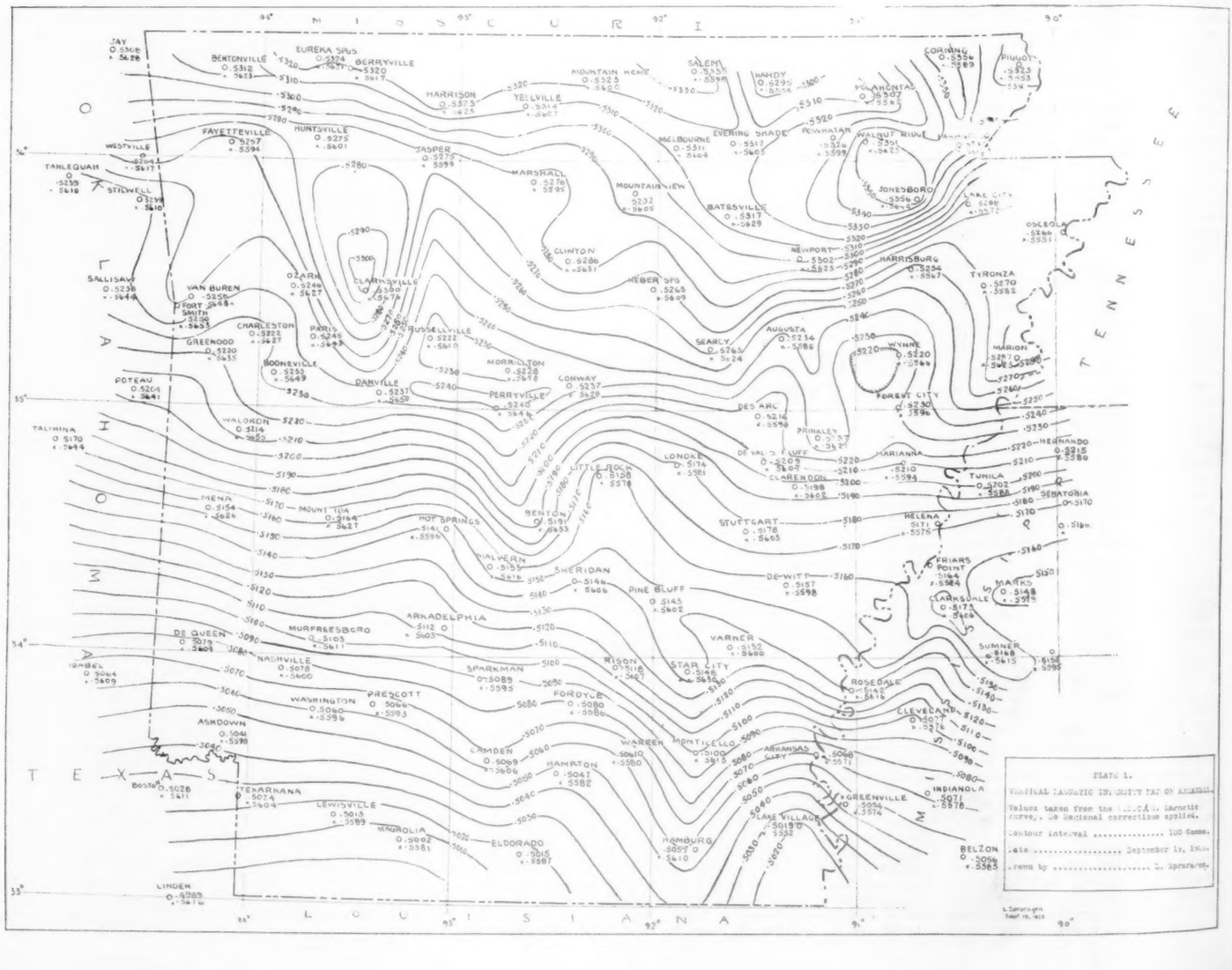
Plate 1 shows the following:

A magnetic syncline with its axis through Greenwood, Sebastian County, and north through Charleston, Franklin County, passing just west of Ozark, Franklin County, to Fayetteville, Washington County.

A magnetic syncline with axis through Russellville, Pope County, north to Jasper, Newton County.

A low in the vicinity of Marshall,

(Continued on Page 95)



Oil Reporter Sees West Texas from Sky

Bucking Plane That Must Have Been Sired by a Mustang Makes It Difficult to Think About Petroleum, but He Does His Best

By James H. Dameron

OVER WEST TEXAS, Jan. 19.—Bumping along over the vast stretches of that expanse of country known as West Texas, a novice in cross country flying is impressed by two dominant thoughts. First, that the contented cows and their relatives have become air minded and are as placid as they were in the good old days of the one-hoss shay; and second, but of great import, is the fact that despite the reputation of West Texas for being a smooth rolling plain there are many, many sections that would make awful landing places in case of a forced landing.

No doubt the veterans in air travel give no heed to such pitfalls that make the most optimistic novice's imagination leap to lethal visions. But to the novice it seems the wind is waging a relentless struggle to batter down the streaking object whining and hurtling into its path. Such struggles make the old boat sail a choppy cruise and one is inclined to view and feel the sensation of a plane bobbing up and down with some alarm.

Through the courtesy of F. W. Burford, president of the Burford Oil Co., the writer made a cross country flight over West Texas in one of the company's planes. Headquartered in Shreveport, La., the Burford company officials are a full day and a night's train ride from its $1,000,000 refinery now under construction in Pecos City. With a plane, officials may leave Shreveport early in the morning and arrive in Pecos in mid-afternoon. Thus the trip to Pecos is accomplished and the return trip made in one-third the time it takes to make the same trip by rail and spend the same amount of time in Pecos City.

Almost Daily Flights

Almost daily flights are made into West Texas by one or more representatives of the scores of companies owning planes and using them for transportation. To those veterans of the air the story is an old one but the number is increasing and hundreds have yet to make their maiden voyage. To those who are either searching for a good excuse to fly to the broad open spaces and those frantically seeking an alibi of merit to postpone the trip for reasons that should be personal, probably this yarn will be of some value.

Fort Worth is as good a port to start from as any. W. G. Fuller, manager of the port, can add to your qualms as adroitly as any while collecting for 30 gallons of gas at 25 cents per from a pilot whose poise refuses to be ruffled despite the uneasy appearance of his passenger.

Arm yourself with a good road map. Everyone likes to search for the hidden secrets of a map, at least Rand & McNally advertise as much. Nevertheless, it is a good plaything after clinging to the thread of life and death as the plane rushes from the ground and darts into the air.

With strange stare you view a wide range of yawning earth for miles and miles. Something has to be done to dispel the gloom that is creeping up. One gets weary of thinking of insurance, the little tiff with the one who treats the family chariot so roughly and the thousand and one things that should have been done and have not. Right there is where the map comes in.

Anyone driving to West Texas knows that Weatherford is about 33 miles out of Fort Worth and presently you should reach the home of Crazy Walter at Mineral Wells if you are driving on the Bankhead Highway. After making the trip over chilling Lake Worth you find the pilot following the Bankhead and railroad, paralleling it. In due time you discover a true course to Weatherford has been followed and the pilot is expert in reading his compass.

Somewhat quieted in nerves it is easier to regard the terrain without the omnipresent thought of dropping kerplunk in the muscle-bound arms of Mother Earth. Under ordinary circumstances you can point out landmarks along the highway. Presently, though, the bumping of the ship again seizes you and the map is once more called into play. Constant searching of the country below and the map does not definitely establish location. There are places that look like landmarks and yet you are not sure.

Doubting Pilot's Ability

It seems it is taking a long time to reach the home of that bottled health fluid. Another look at the watch assures you sufficient time has elapsed for the plane to have reached the place. It seems impossible to keep down fears that a veteran pilot might go wrong on reading his compass. And who would think from reading geographies that this portion of Texas could be so densely wooded, be so hilly and cut up with creeks and small streams which are not conducive to forced landings. How far back was that cleared field? Was that the motor spluttering? What makes the ship roll and rock so dizzily?

You are almost certain the pilot has lost his bearings. But there is a little hope left. It appears there is a clearing miles dead ahead and there is smoke. Those visions of newspaper head lines exclaiming the fatal accident of a p'ane chopping the tops off trees or burrowing into the side of rugged hills begin to fade.

Rapidly you approach a small city and immediately log your map to Mineral Wells. Feeling just a little ashamed of doubting the pilot's compass reading judgment it is only natural to reassure him by showing you know exactly where the ship is, even though you do make the almost unpardonable error of indirectly implying his flying speed is not what it should be.

Promptly you hand him the map logged to show progress as far as Mineral Wells. And then comes a double surprise.

Without any regard for your safety he removes both hands from the controls of a panicky ship. It is strange, you reflect, you had not observed him more closely to determine whether or not he had been permitting the ship to fly without his hands on the controls before. Yet it speeds along much in the same manner.

Fifty Miles Further Along

And while your mind is reeling out the most dire calamities that could befall the passenger during such moments (and it is strange how you think only of the

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Form Petroleum Export Association

Many Economies in Marketing American Oil Abroad Expected to Result From Action of Leading Companies

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Jan. 19.—With 15 leading American oil companies on the roster, the Export Petroleum Association, Inc., has been incorporated under the laws of Delaware, with headquarters in this city. Formal organization of the export group, formed under the provisions of the Webb Act, marks the consummation of the plan for promoting many needed economies in the marketing of American petroleum products abroad through co-operative action within the industry.

Member companies of the export corporation thus far are announced as follows: Atlantic Refining Co., Cities Service Co., Gulf Refining Co., Marland Oil Co., Richfield Oil Co. of California, Shell-Union Oil Co., Sinclair Consolidated Oil Co., Standard Oil Co. of California, Standard Oil Co. of Indiana, Standard Oil Export Corp. (representing operating units affiliated with the Standard Oil Co. of New Jersey), Standard Oil Co. of New York, The Texas Corporation, Tide Water Associated Oil Co., Union Oil Co. of California and the Vacuum Oil Co.

The following board of directors has been selected: W. M. Irish, president of the Atlantic Refining Co.; F. R. Coates, director of the Cities Service Co.; G. R. Nutty, vice president Gulf Refining Co.; D. J. Moran, president of the Marland Oil Co.; C. M. Fuller, vice president of the Richfield Oil Co. of California; J. C. Van Eck, president of the Shell-Union Oil Co.; H. F. Sinclair, chairman of the board, Sinclair Consolidated Oil Co.; K. R. Kingsbury, president of the Standard Oil Co. of California; R. W. Stewart, chairman of the board, Standard Oil Co. of Indiana; W. C. Teagle, president, Standard Oil Co. of New Jersey; C. F. Meyer, president, Standard Oil Co. of New York; R. C. Holmes, president, The Texas Corporation; A. J. Byles, president, Tide Water-Associated Oil Co.; P. N. Boggs, vice president, Union Oil Co. of California, and G. P. Whaley, president, Vacuum Oil Co.

Election of a president has been deferred. Gilbert H. Montague, attorney and vice president and general counsel of the Export Petroleum Association, Inc., will serve as president until the group comes together for the first election. Temporary headquarters for the association will be maintained in Mr. Montague's office at 67 Wall Street, this city.

Working Out Plans

While the export association is now formally organized, it is reported that the various subcommittees are still busily engaged in working out some of the operating plans for the export group. Chief among these at the present time, it is reported, are those dealing with quotas to be allotted the various member firms in export marketing operations.

The Export Petroleum Association, Inc., has not yet started functioning in actual market operations, although the influence of the actual incorporation of the group upon the export situation has already been felt.

Agitation for the export petroleum association was started during the late fall months, when competitive conditions in foreign markets had become such that leaders in the industry decided upon the need for drastic co-operative action to put their foreign operations upon a more efficient and profitable basis. Representatives of leading American oil companies met in this city during October, and discussed the situation, finally deciding upon the organization of a co-operative export group, under the terms of the Webb Act, and similar to export groups maintained by the copper, steel, phosphate, zinc, wood, sulphur and other industries. The meeting was attended by executives of leading companies located in all sections of the United States, and thus was representative of the American petroleum industry as a whole.

Since the initial meeting in October, committees have been busily engaged in working out the various problems presented by the export association idea; in fact, this work is still going on. All of the preliminary investigation work is out of the way, however, and the problems remaining to be solved have to do with the prorating of orders among members, participation by small trade interests, etc.

The Export Petroleum Association, Inc., is expected to be a $500,000,000 corporation, in point of volume, this being the estimate of the probable foreign trade in American petroleum and refined products during 1929.

The rank and file of the petroleum trade are awaiting with interest announcement by the new association as the means to be employed in arranging for participation of the smaller interests in the operations of the export combine. Leaders in the export corporation movement have already signified their intention of making the association representative of the industry as a whole, and it is expected that formal announcement of plans along this line will be made in the near future.

Will Effect Economies

Far-reaching economies in marketing operations are expected to be made when the new export association actually begins functioning. Of prime importance in this connection is the expected saving on transportation charges, through the elimination of many uneconomic long-haul movements, which have been common under the keen competitive conditions which have prevailed in the industry during the past several years. This will naturally mean the cessation of the rather sharp competition for European business which has been evident between East Coast and Gulf refiners, on the one hand, and California on the other, at times during the past year. It will also remove Eastern and Gulf competition from California on business with the Far East and other points closer to the California refining and shipping centers. The figuring of allotments to take care of this shifting about of business is perhaps one of the most difficult tasks confronting the new export association, and until this important question has been settled, it is not expected that the export group will be much of an actual factor in the market situation.

With actual incorporation of the export petroleum group, interest in trade circles concerning the probable amount of co-operation with the European oil cartel has been revived. Some months ago, Royal Dutch-Shell, Anglo-Persian Oil, and Burmah Oil united in a selling agreement covering their operations in foreign fields, along lines closely similar to those involved in the American export consolidation. While formation of the British combine was primarily to

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Economic Phase of Antiknock Fuels

Carbon Removal Cost and Engine Performance Directly Related to Compression Ratio and Gasoline Quality

By L. C. Lichty*

It has long been well known that the work obtained from the internal-combustion engine is a function of the ratio of compression. Analysis of the four-stroke cycle, assuming air as the working fluid, with constant specific heat, gives the relationship

$$\text{Efficiency} = 1 - (1/r)^{0.4} \quad (1)$$

where r is the ratio of compression.

The most accurate theoretical analysis of the internal combustion engine cycle was made recently by George A Goodenough and John B. Baker[1]. In the analysis the actual working fluid was considered, variable specific heats were used, and the temperatures and pressures at the end of combustion were based upon the theory of chemical equilibrium.

While this analysis does not take into account the heat loss to the cylinder walls and the deviation from constant-volume combustion, the results show very accurately the relative value of compression-ratios. Figure 1 gives the results of this analysis for a mixture of gasoline and the required amount of air. It also includes curves showing the air-standard efficiencies and actual results from tests by Ricardo.

Fuel Costs

The cost of power depends upon the fuel cost and the thermal efficiency. Thus

$$\text{Cost of power} = \text{cost per gallon}/(\text{B.t.u. per gal.} \times \text{efficiency}) \quad (2)$$

For a given gasoline price and assuming the heating value per gallon to be constant

$$\text{Cost of power} = K \times 10/e \quad (3)$$

where K is a constant, and e is the thermal efficiency.

The values of 10/e, which have been plotted in the upper full line of Figure 2, show a decreasing cost of power with an increase in ratio of consumption. The relative costs from Ricardo's tests are plotted in a dotted line in the same figure, the relative costs being made to coincide at 5 to 1 with the result obtained from the theoretical analysis. The tests of Ricardo show virtually the same relationship between fuel cost and compression-ratio as did the theoretical analysis.

During the last few years, ratios of compression have been limited to 5 to 1 or thereabout, primarily because of the occurrence of detonation with higher ratios. With the advent of "doped" fuels and special cracked gasolines of high antiknock value, higher compression-ratios are coming into favor. This immediately raises the question of what is the maximum desirable compression-ratio.

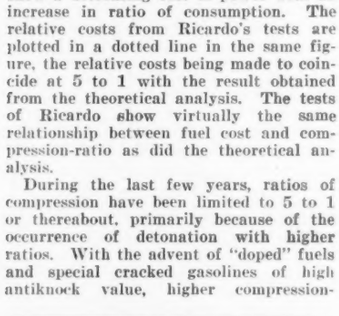

Fig. 1 (Left)—Effect of Compression on Efficiency. Fig. 2 (Right)—Possible Effect of Dope Cost.

The Maximum Desirable Compression-Ratio for the Assumed Cost of Dope Is Found at the Lowest Point of the Curve for Combined Cost of Fuel and Dope. A Is the Saving in Fuel Cost Due to Compression Above 5 to 1.

If a fuel is considered which will operate satisfactorily in an engine with a 5-to-1 compression-ratio without the use of dope, the quantity of dope required to give the same detonating characteristics for higher compressions, and consequently its cost, will be a function of r — 5. A third curve has been plotted in Figure 2, based on the hypothesis

$$\text{Dope cost} = 0.075\ (r - 5)^3/^2 \times \text{relative fuel cost} \quad (4)$$

Adding the ordinates of the two full-line curves gives a third curve representing the total cost of power. This curve has a minimum at a compression-ratio of about 5.75 to 1, which for this illustration is the maximum compression-ratio that should be used if cost of power is to be the minimum.

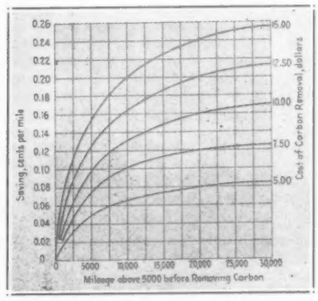

Fig. 3—Saving Due to Less Frequent Carbon Removal

Assuming the Cost of Removing Carbon at the End of 5,000 Miles, the Various Curves Show the Saving in Cents per Mile for Additional Mileage Secured by the Use of Doped Fuel.

It might be possible to use a dope the cost of which, added to fuel cost, would not result in the minimum cost-value but would cause a decreasing total cost as the compression-ratio is increased. The result will depend not only upon the detonating characteristics of the gasoline and the design of the engine, but also upon the relative costs of the gasoline and the dope. With the foregoing condition, or any condition for that matter, it will be of interest to determine the price differential permissible to make the cost of fuel and dope at a given compression-ratio equal to the cost of fuel at the maximum compression-ratio practicable without the use of a dope.

Table 1—Maximum Permissible Dope Costs

Compression Ratio	Relative Gasoline Cost, Cents per Gal.	Cost Decrease Units	Cost Decrease Per Cent
5.0	27.9	0	0
5.5	26.8	1.5	4.9
6.0	25.5	2.4	9.4
6.5	24.6	3.3	13.4
7.0	23.8	4.1	17.2
7.5	23.1	4.8	20.8
8.0	22.6	5.3	23.4

Table 1, prepared from data obtained from Figure 2, gives the relative fuel-cost of power, the decrease in cost from that at a 5-to-1 compression-ratio, and the percentage that the decrease is of the total cost, all for various compression-ratios. The last column also represents the percentage by which the fuel cost can be increased by the addition of dope before the total cost will be greater than for a fuel not doped, with a 5-to-1 compression-ratio. If the fuel cost is increased, by the addition of a dope, by the amount indicated in the last column, no gain in economy will result from the use of higher compression.

Using these values, Table 2 has been developed for various fuel-prices and compression-ratios. As an illustration of its use, assume the price of gasoline to be 20 cents per gallon; in an engine with 6-to-1 compression-ratio, if the doped fuel cost is 21.9 cents per gallon no gain in fuel economy is obtained by using a 6-to-1 compression-ratio rather than a 5-to-1 ratio without the doped fuel.

From a fuel-cost viewpoint alone it is apparent that it is poor economy with low fuel-prices to have compression-ratios higher than 5 to 1 if doped fuel must be used. Referring to Table 2, it will be seen that, with fuel prices up to 30 cents per gallon, a 6-to-1 compression-ratio would not justify a 3-cent differential between doped and standard fuel. With higher compression-ratios, however, there will be a decided advantage if the price differential remains the same, a 7.5-to-1 or an 8-to-1 compression-ratio showing a gain in fuel economy that more than offsets the 3-cent differential for any price of fuel given in the table.

Table 2—Maximum Permissible Costs of Doped Fuel, per Gallon

Gasoline Cost Cents per Gal.	Compression-Ratio 5.5	6.0	6.5	7.0	7.5	8.0
15	15.7	16.4	17.0	17.6	18.1	18.5
16	16.8	17.5	18.1	18.8	19.2	19.7
17	17.8	18.6	19.3	19.9	20.5	21.0
18	18.9	19.7	20.4	21.1	21.7	22.2
19	19.9	20.8	21.5	22.2	23.0	22.4
20	21.0	21.9	22.7	23.4	24.2	24.7
21	22.0	23.0	23.8	24.6	25.4	25.9
22	23.1	24.1	25.0	25.8	26.6	27.2
23	24.1	25.2	26.1	27.0	27.8	28.4
24	25.2	26.3	27.2	28.1	29.0	29.6
25	26.2	27.4	28.4	29.3	30.2	30.9
26	27.3	28.4	29.5	30.5	31.4	32.1
27	28.3	29.5	30.6	31.6	32.6	33.3
28	29.4	30.6	31.8	32.8	33.8	34.6
29	30.4	31.7	32.9	34.0	35.0	35.8
30	31.5	32.8	34.0	35.2	36.2	37.0

Assuming a 3-per cent differential for the cost of dope, figures to the left of the heavy lines indicate that, under the conditions there represented, the results of the high compression do not pay for the additional cost of doped fuel. Under conditions represented by the figures on the right, the high compression pays.

Table 3—Comparative Fuel-Mileage With Various Compression-Ratios

Compression-Ratios 5.0	5.5	6.0	6.5	7.0	7.5	8.0
		Miles per Gallon				
15	15.65	16.37	16.99	17.58	18.12	18.55
16	16.70	17.46	18.12	18.75	19.32	19.80
17	17.73	18.55	19.25	19.92	20.53	21.02
18	18.78	19.64	20.40	21.09	21.73	22.26
19	19.83	20.73	21.52	22.25	22.95	23.50
20	20.87	21.82	22.65	23.42	24.15	24.75

Assuming a mileage as shown in the first column for 5-to-1 compression, the successive compression-ratios may be expected to give the mileages listed under them.

Table 4—Cost of Fuel, in Cents per Mile, Based Upon 15 Miles per Gallon at 5-to-1 Compression

Cost of fuel, cents per gal.	Compression-Ratio 5.0	5.5	6.0	6.5	7.0	7.5	8.0
15	1.00	0.96	0.92	0.88	0.85	0.83	0.81
20	1.33	1.28	1.22	1.18	1.14	1.10	1.08
25	1.67	1.60	1.53	1.47	1.42	1.38	1.35
30	2.00	1.92	1.84	1.77	1.71	1.66	1.62

Carbon Removal Cost

Another factor to be considered, however, is that of carbon removal. A 5-to-1 compression-ratio engine can be operated a certain amount with standard gasoline before detonation makes carbon removal a necessity. At this point, if doped fuel were to be used, the engine could be operated a further amount before carbon removal would be necessary. This will result in a saving which will tend to offset the doped-fuel cost.

If it be assumed that a 5-to-1 compression-ratio engine will require the removal of carbon at 5,000-mile intervals, it is interesting to note what the saving will be if doped fuel is used all the time resulting in greater mileage before remov

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AUTOMOTIVE ENGINEERS DISCUSS HIGH COMPRESSION, ANTIKNOCK

DETROIT, Mich., Jan. 19.—Discussion of high compression and antiknock fuels was an outstanding feature at the annual meeting of the Society of Automotive Engineers here.

L. C. Lichty, M.S.A.E., assistant professor of mechanical engineering at Yale University, presented an analysis of the economic value of the use of high compression fuel, from the viewpoints of fuel cost, carbon removal cost, and engine performance. Mr. Lichty used charts and tables, based on ranges of fuel cost, compression ratio, and cost of carbon removal, and on assumed increases in economy from the higher compression, to evaluate the economies that can be effected under these assumptions. The same methods, he said, can be applied with actual data to determine the economic value of a doped or improved fuel that makes high compression without detonation possible.

Methods were given also that will show the car designer what gains in power can be made by an increase in the compression. Attention was called by Mr. Lichty to the fact that improvement in fuel economy under these conditions may not be so great as expected unless it is accompanied by a change in gear ratio. In conclusion, he argued for high compression as a means of conserving our resources of gasoline, which eventually will be exhausted in spite of unforeseen overproduction in the past.

J. O. Eisinger and Vanderveer Voorhees of the Standard Oil Co. of Indiana, presented a paper on the effect of gum in gasoline. The first part was devoted to engine tests made on gasolines having different gum contents. The tests made indicate the amount of gum which can be tolerated in a motor fuel before it will noticeably affect engine operation. It was found that only the actually dissolved or preformed gum in gasoline at the time of use directly affected engine operation. The gum usually collects on the hot parts of the intake system, particularly the inlet valve. Photographs were given showing the condition of the inlet valve and cylinder head of the test engine. Also, in the first part the gum forming tendency of fuels which are stored for some time prior to use is taken up.

The second part of the paper takes up the causes and methods of testing gasoline for gum. It was shown that gum is chiefly a result of oxidation which is apparently of the autocatalytic type, and furthermore that once a gasoline has started to form gum it usually continues as long as air or oxygen is present. Since no existing gum tests were found satisfactory a thorough study of methods was undertaken with the object of obtaining a reliable test for gum. Two gum tests were devised, one being an oxidation test designed to show the stability of a gasoline toward gum formation, particularly when stored, and the other a modified steam evaporation test to show actual gum in solution at the time the test is made.

An interesting paper on vapor pressure data on motor gasolines was presented by Oscar D. Bridgeman, Elizabeth W. Aldrich and Hobart S. White of the Bureau of Standards.

Donald B. Brooks, of the Bureau of Standards, delivered a paper on operating factors and engine acceleration, detailing some of the results of co-operative fuel research work.

J. T. Fitzsimmons of the Delco-Remy Corp., presented a paper on ignition requirements for high compression engines.

*M.S.A.E.—Assistant professor of mechanical engineering, Yale University, New Haven, Conn.

[1]See Bulletin No. 160, Engineering Experiment station, University of Illinois.

Determining Open Flow by Pressure

Problem of Eliminating Necessity of Blowing Gas Well Wide Open to Gauge Its Capacity Is Very Important

By E. L. Rawlins*

The problem of eliminating the necessity of blowing a gas well wide open to the atmosphere in order to gauge its capacity to deliver gas is very important to the industry. During the past several years a considerable amount of study and thought has been directed to the problem by interested producing companies and individuals. It is very interesting to note that the trend in practically every case of effort has been to impose a back pressure on the sand face while gauging the capacity of the well to deliver gas—and the more back pressure imposed upon the sand face the less the rate of delivery from the well while it is being gauged, and therefore less gas waste.

It is desired to have this problem discussed by each of several engineers who have spent considerable time studying it; to have an interchange of ideas and thoughts as to the possibilities and methods of gauging gas well capacities with as small gas waste and harmful effects on the well as possible; and to crystallize out of the entire discussion plans for furthering study in order that the characteristics of gas flow from a reservoir through sand into the well bore through the producing string to the ground surface under any pressure conditions may be more thoroughly understood. It is only by the combined effort of all interested that the rapid solution of the problem can be made possible and with such co-operation there is little doubt that the idea expressed by one well-known gas engineer, "By the end of 1929 there will be no necessity of blowing a well open to the atmosphere to gauge accurately its capacity to deliver gas," will be a fact. Before beginning the discussions, the entire problem can be more easily understood with a brief preliminary sketch of the developments to within the past year or two. At the same time, a brief discussion of the work done by the co-operation of the Bureau of Mines, various producing companies and the Oklahoma Corporation Commission will be given.

Capacity of Delivery

Any particular gas well has a certain ability to deliver gas into a definite back pressure imposed on the sand face of the well bore. When a gas well is opened to the atmosphere at the well head, it has a definite maximum capacity to deliver gas from the sand to the atmosphere; this capacity depends upon the rock pressure, the sand conditions including texture, frictional resistance, and other factors the volume of void space in the sand, and the casing or tubing which is the outlet from the sand to the atmosphere. This "open flow" usually is measured by "opening the well wide"* at the well head and observing the velocity pressure of the gas with a pitot tube as the gas is discharged into the atmosphere. The rate of flow then is calculated from this velocity pressure.

State Conservation Commissions have adopted rules which specify that open-flow capacity should be determined at definite intervals — in many cases at monthly intervals. Although the rules specify that the well shall be produced at a certain per cent of the open flow in order not to damage the well during operation, determinations of open-flow have not only resulted in gas waste but frequently have been detrimental to the wells. However, at the time that these rules were made there was a necessity of using some method that would be a basis for proration and also would work to keep wells from being produced too rapidly during operation. In most cases, state regulations limit the rate of gas delivery to 25 per cent of the open flow. In the Osage Nation this limit is 20 per cent. Therefore, in addition to the fact that blowing a well wide open to the atmosphere is not desirable, it is the consensus of opinion, including the engineers on the conservation commissions, that 25 per cent open flow does not necessarily represent the most efficient producing condition for any gas well. However, before such rules can be revised, it is essential that a better method be worked out and proved which will answer both questions regarding equitable proration and efficient regulation. This, it is hoped, will be accomplished this year.

The Bureau of Mines, the Corporation Commission of Oklahoma and representatives from different gas companies co-operated in a series of experimental tests in the Chickasha gas field, Oklahoma, to standardize the open flow by the use of well head nipples of different diameters. The results of these tests have been published in a report of investigation, Serial 2885, by the Bureau of Mines.

Open Flow Volumes

The object of this work was to establish a relation between the "open flow" volumes taken through well head nipples of different diameters. The result of the study showed that for a definite size of casing there is an approximate relation between the rates of flow through the well head nipples of different diameters. This fact makes it possible to measure the capacity of a well to deliver gas by using a small nipple and then to determine the open flow or the flow through nipples of any size by reference to plotted curves.

The use of small nipples limits the rate of delivery from the sand and reduces the amount of gas wasted during open flow tests. The relations were the "open flow" through a 4-inch nipple plotted against the "open flow" through 2-inch, 3-inch, 4-inch, $5\frac{3}{16}$-inch, $6\frac{5}{8}$-inch and $8\frac{1}{4}$-inch nipples. These curves give valuable information if studied carefully. In the first place, it is noticed that the capacity of the 2-inch and 3-inch nipples is limited; that a delivery rate greater than 4,000,000 feet per 24 hours should not be measured with the 2-inch nipple; and that one greater than 10,000,000 feet should not be measured through the 3-inch nipple. The possible experimental error is too great to warrant the use of these nipples at higher delivery rates. For example, a change from 4,000,000 to 5,000,000 feet through the 2-inch nipple, if converted to the $8\frac{1}{4}$-inch nipple would be a change from 6,100,000 to 16,400,000 feet. Similarly, a change from 10,000,000 to 11,000,000 feet through the 3-inch nipple, if converted to the $8\frac{1}{4}$-inch nipple would be 17,500,000 to 26,000,000 feet. It is possible to use the 4-inch nipple through the entire range but precautions should be taken in measuring extremely large open flows. For example, a change from 19,000,000 to 20,000,000 feet through the 4-inch nipple if converted to the $8\frac{1}{4}$-inch nipple would be from 44,000,000 to 51,500,000 feet.

Delivery Rates

The wells used in the tests were finished with $8\frac{1}{4}$-inch casing. At these wells, therefore, the gas waste was reduced when the rates of delivery were measured with the small nipples as compared to the waste that would have been necessary through the $8\frac{1}{4}$-inch casing. A 4,000,000-foot delivery rate through the 4-inch nipple means a reduction of 35 per cent of the gas that would have been used for an open flow test through the $8\frac{1}{4}$-inch casing; a 10,000,000-foot delivery rate through the 4-inch nipple means a 43 per cent reduction; and 20,000,000-foot delivery through the 4-inch nipple means a 61 per cent reduction. In the first example the well produced 65 per cent of its open-flow capacity during the open flow test; in the second example, 57 per cent; and in the third example, 39 per cent.

There is, therefore, a determinable size of well head nipple that should be used for an open flow test; the plotted curves are a guide to the proper size. The smaller nipples limit the rate of flow from the sand by imposing a greater back pressure on it; and the sand and water conditions are a guide to the allowable rate of flow so that the well will not be harmed. The small nipples, however, are more liable to cause experimental error, especially for large open flows. The final choice of a well head nipple, if it has the required capacity to deliver the gas, depends upon the waste of gas and the harmful effect on the well on the one hand and on the other upon the possible error in determining open flow capacity. The latter consideration is of secondary importance.

To Eliminate Blowing

To eliminate the necessity of blowing a well to the atmosphere, except when the well is "brought in," a considerable amount of study was devoted to a method for determining open flow capacity based upon pressure observations. The results of this work have been discussed before previous meetings of the gas association and reports published and distributed. Also the method of applying the results practically is somewhat complicated, and in the light of later developments it is believed that simpler methods of using the data will be applied. However, the work does show that fundamental relations between delivery and back pressure for a particular well exist and will be recognized as an important step from the open flow method of gauging to the pressure method. Only a brief summary of it will be given.

The data from many wells indicated that the capacity of a well to deliver gas could be determined at any time after the initial complete test without again "blowing" the well. Also the information indicated the working pressure which should be maintained to produce the well most efficiently. It was necessary, for comparisons, to use the "absolute open flow capacities" of gas wells. This capacity is defined as the quantity of gas that a well could produce if there were no factional resistance except that of the sand and the atmosphere. Tests were conducted on two types of wells; those equipped with siphon lines and those not equipped.

Methods of Testing

To employ this method of determining open flow capacities of gas wells, tests of the original maximum rate of flow together with the series of back pressure tests, are made as follows:

For wells equipped with siphon lines:

1. Close in the well and determine shut-in pressure at the well head.
2. Measure the maximum rate of flow through the production string into the atmosphere, observing the pressure in the production string at the well head and the pressure in the siphon line closed at the well head.
3. Obtain several rates of flow by holding back pressure at the well head, observing production-string pressure and siphon pressure for each rate of flow.
4. Plot two curves on the same chart—one for the relation between absolute production—string pressure and rate of flow.
5. Plot an additional curve on the same chart, showing the relation between the absolute working pressure at the sand and rate of flow. This curve should be extended to intersect the volume axis at zero absolute pressure, thereby determining the absolute open flow.
6. Plot another pressure-capacity curve separately to indicate the delivery in percentage of absolute open flow which can be produced from the sand at various absolute working pressures ex-

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*Before Southwest Division, Natural Gas Department, American Gas Association. Shreveport, La.

DEATH TAKES R. L. WELCH, FORMER COUNSEL AND SECRETARY OF A.P.I.

Robert L. Welch, secretary and general counsel of the American Petroleum Institute until last month, died Monday, January 21, at Phoenix, Ariz., where he had gone in the hope of recovering his health. Mr. Welch went to Arizona from New York only a few days before his death. He had served continuously as secretary and general counsel of the American Petroleum Institute since the organization of that body in 1919 and when illness seized him last year he was granted a protracted vacation.

W. R. Boyd, Jr., executive vice president of the institute, upon receiving word of Mr. Welch's death notified the members of the American Petroleum Institute as follows:

"Bob Welch has passed to the Great Beyond. Throughout its existence Bob Welch has been the active executive officer and general manager of the institute. How well he performed that difficult and nerve racking obligation is too well known to thousands of oil men to require comment. During these years I was his assistant, his intimate companion and friend. If he had been my own brother the news of his death could have been no more shocking. Two years ago his nervous system collapsed and for the past year he has been very ill. However, his medical advisors have constantly expressed the hope that he would ultimately recover.

"Mr. Welch was born in Iowa. He would have been 50 years of age February 5. He started his career as a

(Continued on Page 148)

Robert L. Welch

Discussions of Engineering Problems

EDITED BY R. VAN A. MILLS, PETROLEUM ENGINEERING EDITOR

A WORD OF WARNING

By the Editor

Two serious gas blowouts in the South Little River Field, Greater Seminole district, Oklahoma, and certain methods for bringing the wells under control and guarding against further blowouts in that area were described in a paper by the writer in The Oil and Gas Journal of January 17, 1929. About the time that this appeared in print it was reported that clear water of a brackish character and gas were flowing from between the short strings of surface pipe and the 8¼-inch strings in some of the wells near the Mid-Continent Petroleum Corp.'s No. 2 G. Aleck situated in SE NE SE, Section 23-7n-6e. This well had suffered a blowout by gas from the Cromwell sand on December 13, 1928, and had been brought under control and closed in on January 8.

The appearance of either mud or clear water with gas flowing from between the surface pipe and the 8¼-inch in this vicinity should stimulate immediate action on the part of the operators to prevent further blowouts. It is possible that cementing in the No. 2 G. Aleck as described in the original article upon the blowouts in the South Little River Field has caused the high pressure gas to channel through comparatively shallow water sands to neighboring wells. Or the gas may be coming directly from the Cromwell sand. There is the further possibility that the mud fluid in these wells has settled or been lost through fissures from around the 8¼-inch strings as suggested in the writer's original article. The flow of clear brackish water and gas coming up around the 8¼-inch strings strongly suggests that this has happened.

This may be a false alarm, but with only 18 to 70 feet of surface pipe in these wells and with no chance to shut in high pressure gas successfully with a bradenhead between the surface pipe and the 8¼-inch, it is no situation in which to take dangerous chances. The flow of fluid and gas from around the 8¼-inch is about as indicative of something being wrong as smoke would be if it were pouring out of the windows of a house. Both conditions should receive immediate attention.

Even though these conditions might not develop into serious blowouts they show a situation full of dangerous possibilities. In view of the short lengths of surface pipe in the wells, only a moderate flow of water and gas may in time channel up outside the surface pipe and undermine the derrick piers. Under such conditions it is imperative to kill any flow of fluid and gas from between the surface pipe and the 8¼-inch casing as quickly as possible.

One method of doing this is to spud in a new hole alongside the old hole, run tubing down this new hole and as far as possible into the old hole alongside the 8¼-inch and pump in as heavy mud as the pumps will handle. The principal objection to this method is the danger of damaging the 8¼-inch string by drilling off a collar or by drilling through that casing.

Another method which is already being used by one company operating a well offsetting No. 2 G. Aleck is to run in (that is, "flow in") 1-inch tubing between the surface pipe and the 8¼-inch string to as great a depth as possible and pump in as heavy mud as the pumps will handle. The mud should be weighted as much as possible with Baroid or iron oxide.

With either of these methods the mudding should be continued for a period of one to two weeks, pumping in the mud until it circulates to the surface, then allowing it to settle for at least 24 hours, then pumping mud again until it circulates to the surface, and repeating these operations until the flow outside the 8¼-inch is mudded off as thoroughly as possible under the existing conditions. With either of the suggested methods, Baroid or iron oxide should be used to make the mud as heavy as possible.

It would be good insurance against blowouts to apply these methods to all of the wells close to the Carter Oil Co.'s No. 1 Jim Walker and the Mid-Continent Petroleum Corp.'s No. 2 G. Aleck.

AUTOMATIC FLOWING OF SMALL WELLS

Discussed by Frank Redick of Iraan, Tex.

I have read your comments in The Oil and Gas Journal of December 13, 1928, on the discussions touching upon the automatic flowing of small wells, and the last paragraph of your comments leads me to believe that possibly I said something in my discussion that would tend to create the impression that I thought Mr. Small was not entitled to proper credit for the good work that he has done in the development of his displacement flowing device. If such is the case, I want to say that this most certainly was not my intention as I feel that Mr. Small has accomplished quite a great deal. The fact that he has taken equipment that has been considered a failure for the past 25 years and has perfected it so that it has become a success, should preclude any room for argument.

You mention in your remarks some experimental work that was done along this line by I. L. Dunn a few years ago, and I wish to say that I was associated with Mr. Dunn in his work at that time. As you probably are aware, considerable experimental work was carried on by Mr. Dunn and his associates in developing and perfecting the air drive in the sands of some of the eastern states. I believe that in certain sands they met with considerable success, but in the old Lima Field in Allen County, the air drive did not prove to be of any benefit, and while the experimental work was of much interest, we were unable to accomplish all that was to be desired.

CROOKED HOLES

Discussed by Frank Redick of Iraan, Tex.

Changing the subject to crooked holes, I notice in recent issues of The Oil and Gas Journal a number of articles and discussions on the whys and wherefores of crooked holes, and most of these deal with the rotary method of drilling. While I have not had a great deal of experience in rotary work, I have recently attempted something that may be of interest to others. Our company bought a rotary for work in the Big Horn Basin Field in Wyoming, although this has heretofore not been considered good country for use of rotary drills. On the first well started we were very anxious to overcome, if possible, crooked holes, as we had had a great deal of trouble in the same locality in using cable tools. I rigged up a special tool to run in place of the regular drill collar to keep the hole as nearly straight as possible. This was made by taking a spiral stem that had worn down, as we were drilling a 12½-inch hole, and welding 10-inch casing collars every 3 feet on the spiral stem, and also attaching a 1-inch pipe from the top to bottom in the spiral and welding in either end to direct the returns to the bit. We did not put this device on until we were in the neighborhood of 500 feet deep and the driller stated, when requested to run it, that this was unnecessary as the hole was straight, and that there was no question in his mind but that this device would go straight to the bottom. You can imagine his surprise when it did not go 30 feet out of the conductor pipe, and it took about 24 hours to ream the 350 feet of hole to get the bottom.

Now the question is, if a hole that the driller says is absolutely straight, is so crooked that it would take that long to ream to bottom, just how crooked or how much out of plumb would a hole be before it would present a considerable difficulty in drilling, and after it was drilled what effect would it have on a casing when it was necessary to run that. I think, through discussing these problems, we can begin to see why we frequently have pipe trouble in some of these deep holes. It has always been more or less of a puzzle to me why anyone should think that an ordinary fish tail bit would drill a straight hole. I can conceive of no reason why it should go straight, but I can see a number of reasons why it should go crooked. A few of these reasons have recently been discussed in the Journal. I think that no doubt the hydraulicking and washing effect of the pump has a tendency to keep holes from going straight in drilling, especially where the formation has a number of shells in it, and as there is no guide except the drill collar above it, the bit is free to wander around in most any direction that offers least resistance. I can not help feeling that some of this could be prevented by using a longer and larger drill collar—possibly a 30-foot drill collar would not be too long in certain formations.

I am enclosing herewith a sketch of a drill collar that I have not had an opportunity to try, but I am passing the information to you so that we may receive some comment on it. At first glance, this appears to be nothing more or less than a pipe over a drill collar, but you will notice that it goes farther than that, as there is a bearing at top and bottom, these bearings being lined with composition rubber to eliminate wear and friction as much as possible. In case of wall friction, this outside shell remains stationary while the spindle rotates the bit in the usual manner. The advantage of this is obvious to anyone, and it should work out very nicely where drilling controls are used.

I believe it is a well known fact among drillers that reamers, as they are now made, and run above fish tail bits, will not prevent crooked holes, and I believe that part of this is due to the fact that they are too short and also that where the bit begins to deviate, the rollers come in contact with the wall, and they in turn cut away the wall to such an extent that the bit is allowed to go crooked much the same as if the reamers were not used.

Another point that is not altogether clear in my mind is, just how much out of plumb a hole must be before it is called crooked. In speaking of crooked holes, I think there should be a distinction between those we ordinarily call slanting and those that are crooked enough to cause trouble. I know of a number of wells that have been drilled where the hole is out of plumb but it did not interfere greatly with either drilling or production. These were termed slanting holes, and in other wells I have noticed the crook was so abrupt that drilling was impossible until measures were taken to straighten the hole; these, of course, were termed crooked holes. I have observed in one or two instances that slanting wells started out of plumb from the very surface. I think this was caused largely by the fact that the traveling block was not in alignment with the rotary table, and after a hole is once started slanting, it is almost impossible to get it straight.

I would think that possibly the washing effect on the walls of a hole could be greatly diminished by carrying heavy mud. We experimented some in that direction by taking a common fish tail bit and welding 1-inch pipe on either side of the blade so as to carry the mud directly to the cutting edge. This speeded up the drilling considerably in the softer formations, and I have no doubt that it tended to reduce the washing of the walls considerably. I would say, therefore, that the use of a heavy mud properly directed to the cutting edge of the bit together with the use of a rather long drill collar of slightly less diameter than that of the hole, the use of one of the well known drilling control devices and maintenance of proper weight on the bit would go a long way toward eliminating crooked holes in rotary drilling.

THE QUESTION OF TORQUE

Discussed by O. B. Goldman, Los Angeles, Calif.

There appeared under "Discussions of Engineering Problems" in The Oil and Gas Journal of November 15, 1928, a discussion of the crooked hole problem by W. R. Martin in which he described two extreme cases showing the variation of torque. Quoting Mr. Martin, in the first case, he says: "We encountered a very sticky shale that could only be drilled with a fresh (sharp) fishtail touching the bottom and shaving it; and believe me, it sure turned hard. Here there was all torque and no weight." Regarding the other extreme he says: "In the same territory we had about 200 feet of hard, close lime which seemed to take on a glazed surface or polish. All the weight could be put on the bit and the pipe would turn very easily. Here there was all weight and no torque."

I am convinced that these conditions described by Mr. Martin are exceptional. In fact, they are just the opposite of what would generally be true. Considering first the actual way in which the drillers are working right now at Santa Fe Springs for example, we find this: In medium drilling, they normally use 3-ton pressure (weight) on bottom. In this class of digging, 10 to 20 feet are drilled in a tour. In the Santa Fe Springs hard cap, only 1-ton pressure on bottom is used. In this class of digging, 2 feet of hole is made.

Attempts to use more weight in the hard rock results in a prompt hang up. Of course some drillers have the idea that in a hard formation, they must first "break through" by excessive weight and then "whittle out" the hole but tests show that a steady uniform pressure as large as can be pulled steadily and without a hang-up makes the most hole per tour and leaves the bit in the best condition. One should realize that hand

(Continued on Page 94)

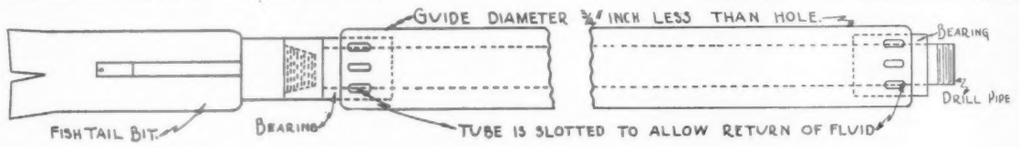

Diagram illustrating a proposed drill collar for centering rotary drill stem in hole.

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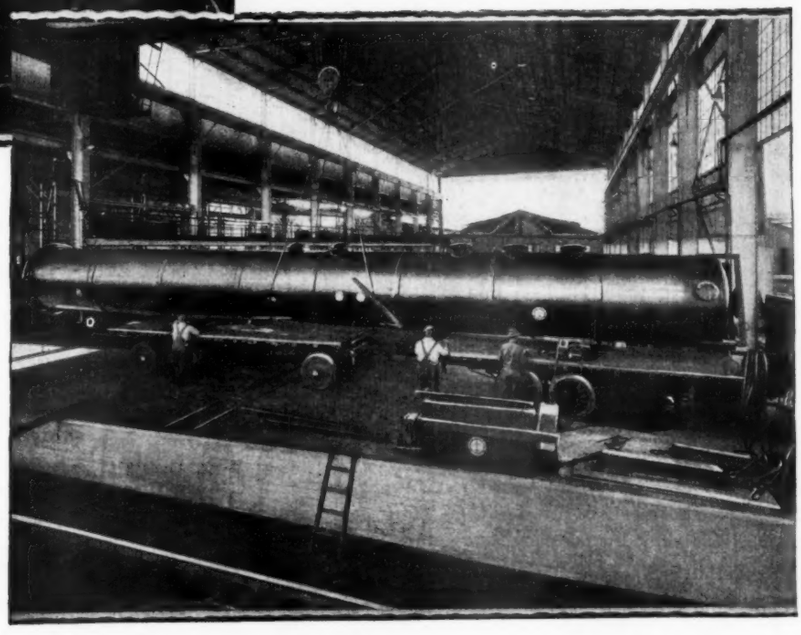

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SELF-REGULATION OR WHAT?

Which is it going to be?

A slashing reduction in crude oil prices?

Self-regulation by the industry?

Or government regulation?

Oil producers have the same choice they had in the spring of 1927. They chose self-regulation then and it was owing to that wise decision that they managed to come through Seminole and West Texas as well as they did.

The situation today is as serious as it was in April, 1927, perhaps more so because of the potential production since discovered. Already there is talk of a crude reduction as the only check on continued overdevelopment.

The price of oil is already below its intrinsic worth. Why should a sane industry continue on a course that will reduce it still further?

Co-operative effort at self-regulation tided the producers through the crisis of Seminole and West Texas. All that is recent enough experience to be known to everyone in the oil business. Yet it was resorted to only because every other plan had failed and there was the plain alternative of self-regulation by the industry or attempted compulsory regulation by government agencies.

It is clear to every observer that voluntary co-operation has gone about as far as it can be carried by the prevailing sentiment of the industry. It is impossible to expect absolute unanimity in any human undertaking. There will always be dissenters. One fatal defect that contributed most to the weakness of the League of Nations was the requirement for unanimity before action could be taken.

The question constantly arises whether progress is to be delayed until unanimity can be attained and the answer invariably is that the will of the majority must prevail if we are to get anywhere.

It was this necessity which forced recourse to the state commissions during the past year. Official approval of the co-operative agreements removed the hesitation of those who feared to support the movement lest it be deemed unlawful, the chief obstacle to earlier attempts at self-regulation by the oil industry.

The success of this co-operation between the state officials and the industry suggested that it might be carried further by definite legislation authorizing or perhaps enforcing co-operative agreements among producers.

This has aroused, not without reason, the doubts of those who think that to invite any form of governmental interference is dangerous. The Oil and Gas Journal recognized this danger in referring to the tentative bills recommended by the committee of the Mineral Section of the American Bar Association, suggesting that any legislation proposed must be carefully presented and limited to helping the industry govern itself with the utmost vigilance against legislation that would force outside regulation upon the industry.

It is not understood that the tentative bills offered for consideration by the industry are to be regarded as the exact form in which such legislation is to be asked from the oil producing states. They are simply a model, the details to be determined by the producers in each state and their legal advisers.

Open forum meetings have been called to discuss them. It will be unfortunate if these meetings develop divisions among the oil men rather than agreement.

As a preliminary to every discussion may it be suggested that the real question is, if these bills are not to be supported what is to be the alternative?

Opponents of state interference will gain nothing by opposing legislation to help the industry govern itself if refusal to ask such legislation leads to conditions that will bring governmental control upon the industry.

It is not a case of let well enough alone because it is not a case of well enough now and the prospect is even more complicated.

The time-honored remedy of crude cuts failed in 1927. That policy simply resulted in the industry disposing of its raw material at ruinous prices. Co-operation in curtailment and conservation taken earlier would have averted that loss, as indeed it avoided greater losses during the past 20 months.

Governmental control of business has been a blighting influence. But the proper and necessary function of Government is widely different. That is why we have laws defining rights, establishing responsibilities. No industry, no business, no human relationship in a civilized country is exempt from that form of legislation, mutually protective and regulative.

As civilization becomes more complex through new inventions and discoveries and conditions laws have to be amended because they become unworkable. The rules of the road that were good enough in the days of the lumbering stage coach were nullified by the advent of the motor car.

Modern science and ingenuity have created new conditions in the production of oil which affect long-established customs in the same way. The industry is outgrowing the conceptions that were thought good enough in the early days. Most of the trouble in the producing division has arisen from the persistent attempt to apply stage coach rules to an automotive age.

If nothing is done, if we "let things slide," there will be a crude cut that will bankrupt thousands of small operators with settled production, the main source of permanent supply. The industry as a whole will be taking unnecessary losses on its products.

The remedy should come from the industry itself. If it fails to offer one a public opinion and Government concerned about the conservation of the national supply of petroleum so essential to the continued progress of the Nation's well being will inevitably take the matter in hand and perhaps force on the industry control that will be infinitely more restrictive than anything now proposed.

It is not a case where the industry can stand still. It must act or take the consequences.

Along the trail of the lonesome pines
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LOWER CRUDE OIL, FUEL OIL AND GASOLINE PRICES IN CALIFORNIA

LOS ANGELES, Calif., Jan. 21.—Marketing conditions on the Pacific Coast which have been unusually weak for the past several months showed a further weakening with the advent of the new year and a general unstable condition is expected to exist during the next few months due to keen competition and the winter season with its smaller demand for refined products. The practical withdrawal of major refiners from the retail service trade has unsettled prices with the result that independent service station operators are dispensing gasoline at anywhere from 14 to 20 cents per gallon at several points on the Pacific Coast. The uniform price prevailing previous to the relinquishment of numerous stations by major refiners was 21½ cents in Los Angeles and 21 cents in San Francisco. The development of substantial production in the Long Beach and Santa Fe Springs Fields has permitted independent refiners to maintain a relatively high operating status with the result that refined oil prices and quotations on refinery residuum have shown a considerable fluctuation in order to meet this competition.

Because no one was adhering to prevailing quotations the Standard Oil Co. was forced on January 14 to cut the price of fuel oil 15 cents per barrel, reducing the price at Los Angeles Harbor from $1 per barrel to 85 cents and at San Francisco from $1.04 per barrel to 89 cents. This reduction in commercial fuel oil was not in harmony with existing quotations on heavy crude oil but this was subsequently corrected when the Standard announced a revision in crude oil prices effective January 18. Light refining crude above 24 degrees remained unchanged as sweet oil is in demand by all refiners. San Joaquin Valley fields were severely penalized by the new schedule due undoubtedly to their distance from tidewater as a long pipe line haul is necessary to place this oil in the commercial market. Heavy crude at Newhall, McKittrick and Kern River was reduced 25 cents per barrel straight through from 14 to 19 degrees in gravity. The base price on 14 to 17 gravity crude at Midway, Sunset, Elk Hills, Coalinga and Wheeler Ridge was reduced 25 cents per barrel but beginning with 18 gravity and continuing up through 23 degrees a variable factor was used in the change between each degree in gravity.

Heavy crude in Los Angeles Basin fields averaging from 14 to 17 degrees, inclusive, was reduced 15 cents per barrel the current price being 75 cents as compared with 85 cents heretofore. Eighteen gravity crude in Los Angeles Basin was cut 10 cents per barrel and 19 gravity crude 5 cents per barrel. At Whittier, LaHabra and Montebello the change extended from 14 degrees up to and including 22 degrees, the base price being 70 cents.

Interesting Program Is Arranged for West Texas Oil Exposition

By Special Correspondent

SAN ANGELO, Tex., Jan. 22.—Oil men from all parts of Texas and the Mid-Continent Field, as well as from distant areas, including Pennsylvania and California, are expected to attend the fourth annual West Texas Oil Exposition to be held here Thursday and Friday of this week. Claude C. Wild, manager of the Board of City Development, under whose auspices the exposition is being held, said plans have been made to entertain the largest number of visitors ever attracted to San Angelo.

The exposition will open at 9 o'clock Thursday morning with a business session lasting till noon. Golf contests, trap shooting and a barbecue have been arranged for the afternoon, and there will be athletic events at the Lyric Theater in the evening.

Another business session will be held Friday forenoon. In the afternoon, following a buffet luncheon for aviators and press representatives, Cromwell Field, the city's municipal airport, will be formally opened. Air races, spot landings and other events are on the card. There will be night flying and landing in the evening, besides dances at the San Angelo Country Club and the roof garden of the St. Angelus.

Levi Smith, president of the Big Lake Oil Co. and vice-president of the Plymouth Oil Co., is general chairman of all arrangements. Robert G. Carr is chairman of the oil division of the Board of City Development, sponsoring the convention. Other members of the division are Herbert O'Bannon, cashier of the San Angelo National Bank; W. F. Clark, head of the land department of the Delmar Oil Co.; Walter H. Ritterbush, head of the land department of the Phillips Petroleum Co.; Dwight L. Hunter, secretary-treasurer of the Western Oil & Royalty Co.; Walter Henshaw, head of the land department of the Henshaw Oil Corp.; and V. E. Cottingham, geologist of the firm of Cottingham & Briscoe.

Transportation is to be handled by Mr. Ritterbush. The golf events are in charge of Mr. Hunter, and the trap shooting events are being arranged by M. L. Mertz

(Continued on Page 147)

Herbert Re-elected President of Fire And Safety Marshals

PITTSBURGH, Pa., Jan. 17.—James H. Herbert of Warren, Pa., was elected president of the Fire and Safety Marshals of the National Petroleum Association at the fourth annual meeting of the marshals held at the William Penn Hotel today. A large number of the eastern refiners were represented at the meeting.

E. M. Lyons, president of the National Petroleum Association, in the opening address of the meeting very highly commended the work of the marshals, stating that eastern refinery executives had come to realize the benefit which all had received from the co-operative work. Mr. Herbert, president of the marshals' organization, emphasized the beneficial results from the group meetings which are held during the year at Bradford, Oil City, Pittsburgh, Warren and West Virginia points. The work of these groups is to make refinery inspections at regular intervals in search of fire and accident hazards.

Mr. Herbert said that employes at 16 refineries have been instructed in first aid by the Bureau of Mines. He asked the co-operation of the membership in advising the department of causes of fires and accidents at their plants. This information is made known to the membership by bulletins.

H. N. Blakeslee, of the National Safe-

(Continued on Page 147)

PURE OIL PIPE LINE POLICY IN MICHIGAN

The Pure Oil Co. in connection with its producing operations in Midland County, Michigan, has completed a pipe line system in order to purchase and gather crude oil. The company on January 15 posted a price of $1.79 at the wells.

The Pure company has established a policy of making a run a sale. A schedule of gathering charge of 12½ cents per barrel up to and including 15 miles and 20 cents per barrel over 15 miles, has been established. These rates will be adjusted as conditions in the field justify. The Mid-Continent policy will be followed in regard to tank strappings and b.s. and water.

High Spots in Field News

SOUTHWEST TEXAS

Joe Bruner production rises to 15,000 bbls. Showings in Austin chalk to be tested.

NORTH TEXAS AND PANHANDLE

Two good wells in Lefors area, Gray County, increased Panhandle and North Texas production total.

MICHIGAN

Pure Oil Co.'s field in Midland County, Michigan, numbers four wells making a total of 450 bbls. daily with prospective long life.

ROCKY MOUNTAIN AREA

New Mexico tests center of attraction in Rocky Mountain area. Interest in discovery near Pueblo, Col. New tests in Lincoln and Uinta Counties, Wyoming.

NORTH LOUISIANA-ARKANSAS

Magnolia well in Sarepta district, Webster Parish, is attracting notice. Gulf Refining Co. acquires interest in Haynesville well and may deepen it.

KANSAS

Haverhill Pool, Butler County, temporarily turns interest from Sedgwick County. Marion County well swabs 104 bbls. in 24 hours and is to be deepened.

GULF COAST

Another coastal field is being opened by Vacuum Co. well on Roanoke Dome, Jefferson Parish, La. It is expected to make a 300 or 400-bbl. producer. Dome was checked by torsion balance in 1928.

CALIFORNIA

Santa Fe Springs continued to show substantial increase due to completions in deep zone.

Production in Elwood Field was increased to 18,000 bbls.

Drilling operations are getting under way in Kettleman Hills.

OKLAHOMA

Steady increase in Oklahoma Fields. New sand found at Oklahoma City. Allen deep sand failure cuts off pool. Big wells at Maud.

Production of Greater Seminole 292,435 bbls. Tuesday morning. St. Louis Pool registers 129,589 bbls.

WEST TEXAS

Southwest limits of Yates Pool definitely established.

New drilling campaign in southern end of Hendricks Pool.

New Yates proration figures show a total potential production of 4,381,192 bbls., an increase of 33,001 bbls.

Skelly Oil Co. well in half-mile southern extension to Hendricks Pool was deepened and flowed at rate of 400 bbls. per hour, cutting 12½ per cent and was pinched in immediately.

Plymouth Oil Co. well in southern Howard County, mile southwest of production, on a 3-hour swab test made 112 bbls. Oil could not be lowered below 900 feet and well is to be deepened.

Late Fields

WEST TEXAS

FORT WORTH, Tex. Jan. 22.—Skelly Oil Co.'s No. 1 Hendricks, C NW SE Section 10, Block B-12, a half mile southern extension to the Hendricks Pool, was deepened with surprising results. At 3,031-32 feet the well had a little water and it was reported the crew was plugging off and would complete the extensioner for a 300-bbl. well from pay topped at 3,028 feet. It was deepened to 3,040 feet with an increase at 3,036 feet and flowed at the rate of 400 bbls. per hour, and cutting 12½ per cent. The well was pinched in immediately.

Another extension well performing with promising results is Plymouth Oil Co.'s No. 1 Kloh Rumsey, Section 5, Block 32, southern Howard County. The well is a mile southwest of production and on a 3-hour swab test made 112 bbls. from 2,294 feet. The oil could not be lowered below 900 feet from the top of the hole and the well is to be deepened.

OKLAHOMA

The production of the Greater Seminole region was unchanged over the week-end. By pools on Tuesday morning of this week the output was:

	Bbls.
Little River	97,500
Maud	30,000
Mission	300
Bowlegs	42,440
Earlsboro	73,000
Seminole	49,700
Searight	5,440
Total	292,435

The best well to be completed in the

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Lefors Area Has Couple of Good Wells

Gray County Gain Sends Panhandle Production Upward. Exceptional Wells in Wichita Falls and Ranger Districts

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Jan. 21.—Panhandle with a couple of big wells in the Lefors area of Gray County was the outstanding district in North Texas throughout the week, although both Wichita Falls and Ranger district reports exceptional wells in those areas.

Because of a big gain in Gray County production, Panhandle made a 1,105-bbl. gain in daily average and boosted the grand total North Texas production to a 591-bbl. gain.

Early in the week Plains Drilling Co.'s No. 2 Saunders, Section 4, Block 1, A.C. H.&B. Survey, was a surprise when it made 2,825 bbls. initial from granite wash pay at 2,555-56 feet. The oil tested 41.5 gravity. After three days of life, however, the well's production was down to 1,400 bbls. daily. In the same area Plains company and Ray's No. 1 Chapman-C, which was completed June 2, 1928, at 2,775-77 feet making 95 bbls., was deepened to granite wash pay at 2,825-30 feet and on a swab test made 600 bbls.

Over west and in Carson County, the Magnolia Petroleum Co.'s No. 6 fee is one of the best wells drilled in that area in several months. It had pay at 3,155-61 feet and made 725 bbls. initial. It is to be deepened as soon as pipe line connections have been made.

Another new well was added to the Armstrong Pool in Moore County when Phillips Petroleum Co. completed its No. 3 J. T. Sneed, Jr. (James). After a 10-quart shot at 3,126-30 feet the well responded by making 785 bbls. on a swab test.

Wichita Falls Area

Flush production in the Wichita Falls district has not been brought in rapidly enough to offset the decline in older wells and consequently the district's daily average, boosted by recent discoveries, is sliding back to its normal level. Wichita County regained its lead in production which was surrendered to Wilbarger County several months ago during the combined booms of the Greyback and Consolidated Pools.

One of the most interesting tests in the district at this time is E. B. Lawson's No. 1 Waggoner-D about 1½ miles south and west of Rock Crossing Pool production. The well is being drilled on a magnetometer high worked by Carl C. Adams. It is along the general play now being made on the theory that a high running parallel to and south of the Greyback and Rock Crossing trend will be discovered.

Considerable leasing is being done on the strength of that theory and some of the tests that have been drilled have partially borne out those interested in the campaign. Lawson's No. 1 Waggoner-D is running high on the Coleman Junction, but how high is debatable. In some quarters it is correlated as topping that marker plenty high while in others it is correlated finding the marker somewhat higher than it is found in the south and western parts of Rock Crossing.

All areas in the Wichita Falls district are showing increases in new work and Jack County continues to move ahead more rapidly than the other counties. Several locations have been staked in the Bryson area of Jack County and many of these are scheduled to be drilling within 60 days to satisfy contract requirements.

The Ranger district was without any important extensions or discoveries during the week but several good completions were made in Shackelford County. As a result of the new flush production in Shackelford the district made a substantial gain in daily average production.

WICHITA FALLS COMPLETIONS

Archer County

F. Payne and others' No. 7 Parrish made 12 bbls. at 1,587-93 feet. H. Donnohu and others' No. 3 Andrews was dry and abandoned at 900 feet. C. W. Gilliland's No. 1 Symank made 52 bbls. at 1,445½-52 feet. His No. 2 Symank was dry and abandoned at 1,492 feet. L. P. Hammond and Continental Oil Co.'s No. 1 Wolf was dry and abandoned at 1,453 feet. L. V. Hull's No. 2 Andrews was dry and abandoned at 951 feet. Perkins & Cullum's No. 2 Williams was dry and abandoned at 588 feet.

Clay County

American Refining Properties' No. 1 fee was dry and abandoned at 515 feet.

Cooke County

Thornton-Taubert Oil Co.'s No. 2 Dennis made 18 bbls. at 1,232-76 feet.

Montague County

Pure Oil Co.'s No. 6 Maddox made 51 bbls. at 832-54 feet.

Wichita County

Continental and Hammond's No. 2 Munger-A was dry and abandoned at 1,812 feet. Goldsmith and others' No. 1 Roller was dry and abandoned at 1,876 feet. Hammon & Garrett's No. 6 McCarty-D made 30 bbls. at 1,288-1,318 feet. Hammon & Garrett's No. 6 Mitchell and others made 90 bbls. at 1,619-38 feet. Holbrook & Wood's No. 28 Kemp & Kempner made 40 bbls. at 1,480-95 feet. Their No. 29 Kemp & Kempner made 150 bbls. at 1,472-96 feet. Panhandle and Hines' No. 4 Burnett made 100 bbls. at 1,378-83 feet. Regal Oil Co.'s No. 2 Martin made 5 bbls. at 564-67 feet. Seaboard and Prairie Oil & Gas Co.'s No. 3 Boyd was dry and abandoned at 1,806 feet. Shell Petroleum Corp.'s No. 3 Denny was dry and abandoned at 634 feet. Staley & Wynne's No. 10 Kemp & Kempner made 187 bbls. at 1,463-85 feet. United Production Corp.'s No. 2 Allen & Kemp made 150 bbls. at 1,477-92 feet. Its No. 7 Hodges-A made 128 bbls. at 1,473-88 feet. Its No. 8 Hodges-A made 160 bbls. at 1,473-90 feet.

Young County

Johnson's No. 1 Casey was dry and abandoned at 875 feet. Pennell Oil Co.'s No. 1 Williams was dry and abandoned at 650 feet. Riggs and others' No. 10 Sweet was dry and abandoned at 570 feet. Wise & Jackson's No. 3 Calvin made 10 bbls. at 594-96 feet. Nash & Windfohr's No. 1 Ware made 440 bbls. at 2,145-75 feet.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week ended January 19

Company, Well, Farm, Name, Section and Block—	Remarks—
CARSON COUNTY	
Denson et als' No. 1 W. E. Cobb, 930 ft. from N line, 280 ft. from E line, W½ NW, Sec. 184, Blk. 2, I.&G.N. Sur.	Drlg. 900 ft.
Delmar Oil Co.'s No. 3 Noel, 330 ft. from E line and 990 ft. from N line W½ SE, Sec. 198, Blk. 3	Location.
Duncan & Reiger's No. 1 J. B. Hodges, 330 ft. from E line and 330 ft. from S line, W½ NW, Sec. 112, Blk. 7, I.&G.N. Sur.	Rig on ground.
Holmes et als' No. 1 Quinn, 330 ft. from S and 330 ft. from E line SW, Sec. 7, Blk. 9, I.&G.N. Sur.	Drlg. 290 ft.
Magnolia Pet. Co.'s No. 6 fee No. 244, 660 ft. from N line and 660 ft. from E line E½, Sec. 91, Blk. 4, I.&G.N.R.R. Sur.	Top pay 3,155-61 ft; 725 bbls.; ¼ to d.d.
Morris et als' No. 1 Barnard, NW cor. SW SE, Sec. 44	Fishing 880 ft.
Navajo Oil Co.'s No. 2 Poling, 660 ft. from W and 330 ft. from N lines, N 30 ac. SW, Sec. 22, Blk. X-2, T.T.R.R. Sur.	Drlg. 3,500 ft.
Reynolds et als' No. 1 E. Cooper, 330 ft. from S line and 330 ft. from E line NW, Sec. 5, Blk. 9, I.&G. N.R.R. Sur.	Drlg. 1,900 ft.
Spartan Oil Co.'s No. 1 S. Bednorz, NW cor. E½ NW, Sec. 202, Blk. 3, I.&G.N. Sur.	Rig burned 2,165 ft. and S.D.
Skelly Oil Co.'s No. 10 Schafer, 1,320 ft. from W line and 330 ft. from S line of N½, Sec. 188, Blk. 3, I.&G.N.R.R. Sur.	Drlg. 2,710 ft.
Skelly Oil Co.'s No. 11 Schaffer, 330 ft. from S line and 990 ft. from W line, Sec. 88, Blk. 4, I.&G.N. R.R. Sur.	Location.
Skelly Oil Co.'s No. 12 Schaffer, 330 ft. from S line and 1,650 ft. from W line of Sec. 88, Blk. 4, I.&G.N.R.R. Sur.	Location.
Stubblefield et als' No. 1 Cooper, 340 ft. N and 330 ft. W line SE, Sec. 5, Blk. 9	C.O. 3,080 ft; S.O. 3,085 ft.
Travis et als' No. 1 D. A. Harrell, C NE NE, Sec. 162, Blk. 7, I.&G.N. Sur.	Fish. 2,510 ft.
Ware et als' No. 1 Ware, 990 ft. S and 400 ft. E NW cor. Sec. 18, Blk. 3, A.B.&M. Sur.	Drlg. 2,900 ft.
CASTRO COUNTY	
Colorado O. & R. Co. No. 1 M. Slemmons, SW cor. Sec. 73, Blk. M-17, B.S.&F. Sur.	Rig blown down.
Mystery Oil Co.'s No. 1 J. I. Crum, SE cor. NE. Sec. 333, Blk. M-6, S.K.&K. Sur.	S.D. 510 ft. for csg.
CHILDRESS COUNTY	
C. L. Sloane et als' No. 1 B. P. Smith, Sur. 49, F. P. Knott lands	Drlg. 4,120 ft.
The Texas Co.'s No. 1 Smith, 100 ft. each way from NW cor. Sec. 174, Blk. H, W.&N.W. Sur.	Hole full sulphur wtr. 3,985 ft; S.D. 4,605 ft.
COCHRAN COUNTY	
V. T. Bolin et al's No. 1 C. C. Slaughter, 1,650 ft. E and 660 ft. S of NW tract, League 118, Knox County School land	Rigging.
COTTLE COUNTY	
Explin. Co.'s No. 1 Richards	Drlg. 2,080 ft.
Explin. Co.'s No. 4 Matador Land & Cattle Co., C, Sec. 46, J. H. Stephens Sur.	Fish. 2,940 ft.
Skelly Oil Co.'s No. 1 J. H. Cannon	H.F.W. 3,558 ft; drlg. 3,989 ft.
Sun Oil Co.'s No. 1 T. B. Yarborough, 485 ft. S and 2,460 ft. E NW cor. Sec. 551, Blk. H. W.&N.W. Sur.	C.O. 3,441 ft.
DONLEY COUNTY	
Beaudoin et als' No. 1 Ball, 1,075 ft. from N line and 985 ft. from E line, Sec. 22, Blk. E, D.&P.R.R. Sur.	Location.
GRAY COUNTY	
Anderson et als' No. 1 Heitholt, C NE SW, Sec. 152, Blk. 3, I.&G.N. Sur.	Location.
B. S. Arnold's No. 1 J. E. Mingale, C E 160 ac., Sec. 212, Blk. B-2, H.&G.N. Sur.	S.D. 1,412 ft.
Arnold & Howell's No. 1 Turnex, C SW, Sec. 111, Blk. B-2	S.D. 2,224 ft. for pipe.
Barnsdall Oil Corp.'s No. 1 M. B. Davis, NW cor. W½ SE, Sec. 9, Blk. 1, A.C.H.&B. Sur.	Rig on ground.
Camel Oil Co.'s No. 1 Harrah-B, 330 ft. each way from NW cor. NE, Sec. 150, Blk. 3, I.&G.N. Sur.	Cellar.

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NORTH TEXAS

Estimated Daily Average Production
Week Ending January 19

	Bbls.
Panhandle district—	
Carson County	5,640
Gray County	23,145
Hutchinson County	27,890
Moore County	2,315
Potter County	20
Wheeler County	690
Total this week	59,700
Total last week	58,595
Increase	1,105
Wichita Falls district—	
Archer County	17,820
Baylor County	77
Clay County	458
Cooke County	2,458
Jack County	1,685
Montague County	7,303
Throckmorton County	684
Wilbarger County	28,517
Young County	7,791
Wichita County	29,163
Total this week	95,956
Total last week	96,619
Decrease	663
Ranger district—	
Brown County	9,306
Callahan County	3,634
Coleman County	3,309
Comanche County	1,210
Palo Pinto County	388
Ranger	5,701
Shackelford County	11,738
Stephens County	7,135
Total this week	42,421
Total last week	42,272
Increase	149
Grand total this week	198,077
Grand total last week	197,486
Increase	591

Wilbarger County

Fain McGaha Oil Corp.'s No. 1 Waggoner-DD made 160 bbls. of oil and 15 bbls. of water at 1,918-22 feet. Its No. 28 Waggoner-S made 400 bbls. at 2,408-51 feet. Its No. 29 Waggoner-S made 600 bbls. at 2,297-2,308 feet and 2,396-2,439 feet. Waggoner Refining Co.'s No. 1 Waggoner-K made 52 bbls. at 2,330-35 feet and was drilled to a total depth of 2,447 feet.

RANGER DISTRICT

Brown County

Amerada Petroleum Corp.'s No. 2 Guthrie was dry and abandoned at 727 feet. Caldwell's No. 3 Caldwell made 3 bbls. at 560-79 feet and was drilled to a total depth of 630 feet. Gore & Brown's No. 2 Mayes made 5 bbls. at 670-79 feet. Green Oil Co.'s No. 2 Hill made 10 bbls. at 847-55 feet. Gutzman's No. 8 Stanley made 12 bbls. at 415-29 feet. Lloyd Oil Co.'s No. 13 Collier made 10 bbls. at 422-39 feet. Its No. 14 Collier was dry and abandoned at 475 feet. McClung's No. 1 Davis was temporarily abandoned at 740 feet. Riordan and others' No. 1 Pugh was dry and abandoned at 1,285 feet. Humble Oil & Refining Co.'s No. 28 Hickman made 24 bbls. at 1,197-1,217 feet. Midsun and Bennan's No. 1 Bull was dry and abandoned at 1,295 feet. Milham Oil Corp.'s No. 7 Rosser was dry and abandoned at 1,357 feet. Phillips Petroleum Co.'s No. 1 Debusk was dry and abandoned at 3,103 feet. Ramsey's No. 5 Henson was dry and abandoned at 1,440 feet. Stone Gilbert and others' No. 1 Tate was dry and abandoned at 1,421 feet. Venezuela Mexican Petroleum Co.'s No. 22 Hickman made 35 bbls. after having been shot with 20 quarts at 1,226-50 feet. Young Brothers, Alexander and Woodley Petroleum Co.'s No. 18 Hickman made 25 bbls. at 1,243-64 feet.

Callahan County

Holmes and others' No. 3 Hickman made 6 bbls. at 441-57 feet and was plugged back to 450 feet. Their No. 1-A Hickman was dry and abandoned at 512 feet. Moutray Oil Co.'s No. 10 Hatchett made 20 bbls. at 350-58 feet. Stratton's No. 1 Smith was dry and

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Yates Pool is Defined to Southwest

Another Disappointment in O'Brien Pool. New Drilling Campaign in Southern End of Hendricks Pool. New Leck Producer

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Jan. 21.—Definitely defining the Yates Pool to the southwest, another disappointment in the O'Brien Pool, a new drilling campaign in the southern end of Hendricks and some remarkable wells in the older part of Hendricks were among the more noteworthy of the week's developments in West Texas. West Texas production made a 10,000-bbl. upward swing due to the increases in three of its major pools.

The southwest limits of Yates apparently have been defined by two wells drilled by the California Co. No. 1 Smith, Lease 5, in the NE part of Section 16, Block 194, and 2 miles due west of the Gulf company's southern extensioner, had a hole full of sulphur water from 1,630-34 feet and was drilled to a total depth of 1,658 feet. It is being straightreamed at 1,607 feet so casing can be lowered to cut off the water and drill deeper.

One mile due west of this well and in Section 15, California Co.'s No. 1 Smith Lease 4, cored lime at 1,590 to 1,671 feet and had 4 bailers of sulphur water per hour at 1,612-18 feet and 1 bailer per hour at 1,649-52 feet. The well is shut down at 1,671 feet.

In the older part of the field, Mid-Kansas Oil & Gas Co. and Transcontinental Oil Co.'s No. 27 Yates-B, Section 61, Block 194, was completed at 1,175-1,414 feet making 1,987 bbls. in 45 minutes.

Yates Potential Increase

The new Yates Pool proration figures released the middle of the month show the field to have a total potential production of 4,381,192 bbls. This is an increase of 33,001 bbls. over the previous semimonthly report. Three new units were added to production and only three old wells were gauged for proration purposes.

Finding of big flush production in the southern end of the Hendricks Pool is making it the most actively developed part of the pool. Humble Oil & Refining Co. made five new locations in Section 10, Block B-12, and the Southern Crude Oil Purchasing Co. added three more the latter part of the week. Skelly Oil Co. added half a mile to the productive territory of the southern end of the pool early in the week, but when deepened to 3,032 feet it encountered a little sulphur water. Pay was topped at 3,028 feet and the water was plugged off and the well completed making 325 bbls. daily.

In the older part of the pool, Southern Crude company's No. 5 Hendricks T-88-H, Section 28, Block B-5, topped pay at 2,730 feet and at a total depth of 2,968 feet the well was estimated good for 10,000 bbls. of pipe line oil daily. Another good completion is the Shell Petroleum Corp. and The Texas Company's No. 11 Hendricks-A, Section 29, Block B-5. It had increases at 2,932 feet and 2,934 feet and flowed 6,466 bbls. in 11 hours, 1 per cent water.

Southern Crude Oil Purchasing Co. has made locations for two northern extension tests to Hendricks. The first was No. 1 Hendricks T-88-CX, 440 feet from the south and 330 feet from the east lines of Section 21, Block 26. No. 2 Hendricks T-88-Q is 440 feet from the north and 330 feet from the west lines of Section 27, Block 26.

Disappointment in O'Brien Pool

Another disappointment in the O'Brien Pool, 3 miles south of Hendricks, was when Gulf Production Co.'s No. 3 O'Brien, Section 31, Block F, got sulphur water at 3,040-43 feet. Just above this a show that put 150 feet of oil in the hole was encountered. It has been drilled to 3,082 feet and is being straightreamed at 3,007 feet. No. 2 O'Brien, in the NW cor. Section 31, had 80 feet of salt and sulphur water at 3,072 feet. The north offset to the discovery well has 2,000 feet of oil in the hole and is putting on well connections.

Another producer was completed in the Leck area north of Hendricks when Amerada Petroleum Corp.'s No. 2 Leck, SW cor. SE. Section 3, Block 74, tested 35 bbls. per hour, 12 per cent water on a 14-hour test at 3,110-20 feet. This is an east offset to Empire Gas & Fuel Co.'s No. 2 which made 66 bbls. in 12 hours at 3,140-50 feet.

Howard County

No further tests have been made with Plymouth Oil Co.'s No. 1 Kloh-Rumsey, western extension to the Roberts-Settles Pool. Cosden Pipe Line Co. is building a gathering system to the well and no tests will be made until the line is ready for service. Group No. 1 Oil Corp. and Marland company have staked an offset location. Their No. 1 Overton is 1,650 feet from the south and 2,310 feet from the east lines of Section 5, Block 32, T-2-S, T.&P. Survey.

The best shallow well in Howard County was completed last week when Hyer and Yates' No. 2 Clay in the old Chalk Pool was finished at 1,802-38 feet flowing 300 bbls. the first 24 hours. In the Roberts Pool, Superior Oil Co.'s No. 3 Dora Roberts-E, was plugged at 3,096 feet after getting a hole full of sulphur water at 3,073 feet. The same company completed the biggest producer of the week in the Roberts Pool with its No. 8 Dora Roberts-B which tested 2,840 bbls. initially from lime pay at 2,940-50 feet.

White Eagle Oil & Refining Co.'s No. 1 Dunbar, C NW, Section 46, Block 34, T-4-S, T.&P. Survey, Glasscock County, is creating considerable interest in that section. It topped the salt at 1,140 feet and is drilling at 1,835 feet. The well is running between 40 and 50 feet higher than wells drilled in that territory.

Big Lake's Deep Well

Texon Oil & Land Co.'s deep Reagan County producer in the heart of the Big Lake Pool continues to establish a new production peak each week. For the 24-hour period ending Monday morning the well produced 1,640 bbls. but the volume of gas decreased from 17,505,000 feet to 16,804,000 feet. For the 24-hour period ending Sunday morning the well made 1,575 bbls.

Skelly Oil Co.'s No. 3 University, Section 33, Block 8, did not improve in production when deepened and virtually smothers the prospects for another major pool in Reagan County. After being drilled to 3,163 feet the hole filled with sulphur water. It is being plugged back to 3,095 feet where it made 98 bbls. on the pump.

Runs to Storage Decline

Runs to storage in West Texas declined approximately 3,000 bbls. for the week ending January 10, as pipe line movements, tank car shipments, and runs to refineries all increased. Production for the same period also increased. The following is a summary of crude movements in West Texas for the week ending January 10:

	Bbls.
Pipe line runs	232,622
Tank car shipments	29,470
Runs to West Texas refineries	31,574
Total disposition	293,677
Daily production	350,010
Runs to storage	56,333

Texas Pipe Line Co. is stringing 10-inch pipe from Hendricks to McCamey. This will be a part of the company's main line trunk system to the Coast. The line will be built with 12-inch pipe from McCamey to Houston.

WILDCAT OPERATIONS IN WEST TEXAS

Week Ended January 10

Company, farm and location—	Remarks—
ANDREWS COUNTY	
Deep Rock Oil Co.'s No. 1 Hostetler, 2,310 ft. N and W of SE cor. Sec. 20, Blk. A-46	Hole full water 1,390 ft.; underreaming 10-in. casing; top salt 1,890 ft.; drlg. 1,950 ft., salt.
BORDEN COUNTY	
Condor Oil Co.'s No. 1 E. A. Hall, 1,650 ft. S and W of NE cor. Sec. 5, Blk. 32, Twp. 3n, T.&P. Sur.	Top salt 1,235 ft.; set 6-in. casing 1,805 ft.; repairing engine 3,802 ft.
Teas & Wheeler's No. 1 Long, 1,320 ft. N and E of Sec. 27, Blk. 30, T. & P. Sur.	Location.
BREWSTER COUNTY	
E. W. Bateman et al's No. 1 Nevill, 2,000 ft. from S line and 1,000 ft. from W line of Sec. 64, Blk. 13, G.H.& S.A.R.R. Sur.	Drlg. 1,130 ft.
Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor. Sec. 4, Blk. G-15, G.C.&S.F.	Rigged up and shut down.
Cowden & Bowser's No. 1-A Jackson & Harmon, Sec. 1, Blk. 331, T.C.R.R. Sur.	Set 8-in. 1,530 ft.; shut down 2,000 ft.
Forrest Oil Co.'s No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur.	Shut down 1,145 ft.
J. M. Hickey's No. 1 Jackson & Harmon, NE cor. Sec. 182, Blk. 9, G.H.&S.A. Sur.	Shut down 1,150 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 mi. S of Alpine	Shut down 1,740 ft.
Williams and others' No. 1 Poncey, 459 ft. S and 1,062 ft. E Sec. 26, Blk. 214, T.&St.L.R.R. Co.	Shut down 515 ft.
COKE COUNTY	
Cates & Dennis' No. 1 Mimms, 2,500 ft. S and 330 ft. E of NW cor. Sec. 47, Blk. 4, T.&P. Sur.	Shut down 1,465 ft.
Lipan Oil Co.'s No. 1 E. C. Rawlings, Sec. 390, Blk. 1-A, H.&T.C. Sur., elev. 2,750 ft.	Shut down 2,860 ft.
Louisiana O. & R. Co.'s No. 1 Powers, 745 ft. S and 2,310 ft. E of NW cor. Sec. 156, Blk. 2	Hole full water 2,980 ft.; underreaming casing 3,373 ft.; drlg. 3,585 ft.
Mid-Kansas Oil Co.'s No. 1 W. E. Lackey, 330 ft. N and E of SW cor. Sec. 272, Blk. 1-A, H.&T.C.	Drlg. 2,915 ft.
CONCHO COUNTY	
Duffey & Silk's No. 1 Hill, 150 ft. N & E. of SW cor. Sec. 8, Blk. 70, H.&T.C. Sur.	Drlg. 750 ft.
Duffey & Silk's No. 1 Noyes, Cen. SE Sec. 19, Blk. 70, H.&T.C. Sur.	Location.
Duffey & Silk's No. 1 Lovelace and Lockett, 1,056 feet N. and 640 ft. W of SE cor. Sec. 66, Blk. 70 H.&T.C. Sur.	Shut down 650 ft.
Exploration Co.'s No. 2 Hartgrove, 900 ft. S and 985 ft. E of NW cor. Johann Scheuch Sur. No. 240	Rig.
Loyd Jones Co.'s No. 1 Jones, 420 ft. S and 15 ft. E of NW cor. John G. Reh Sur. No. 1,878	Drilled to 660 ft. and shut down.
Posey's No. 1 Elvidge, C NW Sec. 39, H.&T.C.R.R. Sur.	Shut down 360 ft.
CRANE COUNTY	
Duffey and others' No. 4 Cowden, 1,320 ft. S and 440 ft. W of Sec. 18, Blk. X, C.C.S.D.&R.G.N.G.	Drlg. 702 ft.
Gulf Prod. Co.'s No. 7 Crier-McElroy, 330 ft. N and E of SW cor. Sec. 196, Blk. F, C.C.S.D.&R.G.N.G. Sur.	Drlg. 2,775 ft.
Gulf Prod. Co.'s No. 59 Crier-McElroy, 330 ft. S and E of NW cor. Sec. 195, Blk. F, C.C.S.D.&R.G.N.G. Sur.	Top salt 1,110 ft.; drlg. 2,790 ft.
Gulf Prod. Co.'s No. 6 Waddell, C NW NE Sec. 12, Blk. B-25	Drlg. 737 ft., red rock.
CROCKETT COUNTY	
Barbara Oil Co.'s No. 1 Cox, 237 ft. S and 1,190 ft. E of NW cor. R. B. Dickenson Sur.	Show gas 1,000 ft.; shut down 1,290 ft.; flowing water.
Lewis & Daniels' No. 1 Pecos River Bed, 19 yards S and 37 degrees E of NW cor. Sec. 33, Blk. 1, I.&G.N. Sur.	Shut down 80 ft.
W. W. Donnelly & Young's No. 1 Shannon, SW SW SE Sec. 42, Blk. BB, T.C.R.R. Sur.	Cleaning out 1,719 ft.
W. W. Donnelly & Young's No. 1 Middlebuster, C Sec. 11, Blk. 9, D.&S.E. Sur.	7,000,000 ft. gas at 1,663 ft.; shut down 1,690 ft.; small oil show.
J. D. Wheeler's No. 1 State Land, 744 ft. S and 1,260 ft. E from SE cor. Sec. 73, Blk. 1, I.&G.N.R.R. Sur., but in Vacancy Strip	Cleaning out 337 ft.

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WEST TEXAS
Estimated Daily Average Production
Week ended January 10

County—	Wells	Prod.
Crane County	272	36,077
Crockett County	47	2,460
Ector County	2	1
Fisher County	7	870
Glasscock County	18	742
Howard County	236	38,943
Jones County	61	7,120
Loving County	8	390
Mitchell County	142	2,852
Pecos County	284	74,762
Reagan County	238	18,277
Runnels County	3	160
Scurry County	5	21
Upton County	261	13,502
Ward County	1	100
Winkler County	516	172,221
Total this week	2,101	369,040
Total last week	2,076	359,004
Increase	25	10,036

WEST TEXAS COMPLETIONS

Concho County

Sartain Oil Co.'s No. 1 Bryson was temporarily abandoned at 400 feet.

Crockett County

Zoch and others' No. 1 Tippett, located 330 feet from the center of the northeast line, Section 45, Block 31, H. &T.C.R.R. Survey, was dry and abandoned at 1,553 feet.

Mitchell County

Hucony Gas Co.'s No. 1 Weichel, located 2,310 feet north and 990 feet east of SW cor. Section 78, Block 26, T&P. R.R. Survey, was dry and abandoned at 4,002 feet.

Jones County

W. G. Clark and Atlantic Oil Producing Co.'s No. 1 Thomas, located 350 feet south and 103 feet west of NE cor. Section 13, Block 19, was dry and abandoned at 2,617 feet. Cosden, Herbert and others' No. 5 Bickley made 520 bbls. at 2,475-92 feet. Marland Oil Co.'s No. 5 Mason made 422 bbls. at 2,513-18 feet. Its No. 6 Mason made 256 bbls. at 2,503-05 feet. Phillips Petroleum Co.'s No. 5 Mason, located 990 feet south and 330 feet west of NE cor. W half NE, Section 18, Block 19, T.&P.R.R. Survey, made 316 bbls. at 2,515-21 feet. Roberts Oil Corp.'s No. 4 Smith location was abandoned. The Texas Company's No. 3 Carter, located 330 feet south and west of northwest corner Carter 173.5-acre tract, Section 13, Block 19, T.&P.R.R. Survey, made 50 bbls. at 2,487-92 feet. Its No. 4 Carter made 10 bbls. at 2,503-05 feet. Woods & Williams' No. 1 Parr.

(Continued on Page 142)

One of the most serious obstacles to complete stabilization in the industry is the present low price of fuel oil

Operations should be restricted to the end that this fuel oil, instead of being dumped on the market at a loss, be made to yield the maximum of gasoline This in turn will reduce stocks of fuel oil, which will result in its advance to a proper price level

Dubbs Licensees, operating by the non-residuum method, with fuel oil as their charging stock, are already aiding in solving this problem to their own material profit—direct and indirect

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Steady Increase in Oklahoma Fields

New Sand Found at Oklahoma City. Allen Deep Sand Failure Cuts Off Spread of Pool. Skelly Gets Big Well at Maud

By J. L. Dwyer
Staff Correspondent, Oklahoma Fields

Substantial gains in the output of the Greater Seminole pools and the Allen Pool of Hughes-Seminole-Pontotoc Counties were offset by a sharp decrease in production of the St. Louis Pool with the net result that the daily average output for the week in Oklahoma showed an increase of about 5,000 bbls. The State's production continues to increase as predicted in this department several weeks ago, and the end is not yet in sight. There are several danger spots on the horizon, the Mission Pool, the west side of the Maud area, and the Allen deep sand operation which, although dimmed, is still rather important.

The combined effect of all these factors has not done any good to a crude market which was rather weak since the beginning of 1929, and should the output of the State continue to climb at this time when seasonal conditions place demands for crude oil and its products at the low ebb of the year, apprehension regarding the stability of the crude oil price structure in the Mid-Continent seems justified.

The increases in production are coming at a time when the refiners are reducing their daily crude runs to stills, and this, backing up on the pipe line and purchasing companies, reflects a condition which would justify a reduction of crude oil runs from leases. Of course the actual result of runs from leases will not be affected in any way, but the price situation may be devised downward. At any rate, the crude purchasing companies, while taking care of their permanent connections as always, would be willing to take less oil temporarily.

Market Change

Following a rapid change in the basic situation, which has so often happened to the business of producing oil, the market has changed from a bullish position last fall to a rather weakened condition at this time. There are two factors which will exert unusual interest on the crude oil situation in the near future. These are the weather conditions and the Oklahoma pools already discovered and now in process of development. Should an early spring season be experienced, the gasoline demands will naturally take care of some extra production. The future of the pools now being drilled will mean much and should substantial increases be registered, they may prove the equal of the straw which broke the camel's back.

In the matter of leasing activity, there seems to be a resumption of the leasing in far western Oklahoma. This is the section which was being leased just prior to the discovery of oil in the Oklahoma City wildcat.

Allen Deep Sand and Mission Pool

In the fields, the Allen deep sand operation and the Mission Pool of the Greater Seminole area command the major interest at this time. Now that many of the 77 drilling wells in the Mission Pool have reached a stage at which definite geological correlations may be established, it seems that many of the wells even in the heart of what was thought to be the pool will prove to be disappointing. There are a number of wells which have reached the Simpson sand and are shut down in that formation. The Simpson sand, being directly above the Wilcox formation, is a definite marker, and an inspection of the wells which have reached that formation influences the thought that as a whole the Mission region is going to be very disappointing. There will very likely be several spots which will be very rich in output for the area, but it seems that as far as the prospect of opening another Bowlegs or another Earlsboro Pool, Mission will not be in the running.

The only one well in the Mission area which has touched the Wilcox sand is the Tidal Oil Co.'s No. 1 Nellie, NE cor. SE Section 12-8-5, on the west side of the pool. This operation found the Wilcox sand 4,389-95 feet and had a hole full of water right in the top of the formation.

From an inspection of the logs of wells drilling in this region, there are several wells drilling on the southeast edge of the Mission Pool which seem to be running rather high, and may result in carrying the productive region over in that direction, which at first was considered the least attractive side of the pool.

There was little news last week from the Bowlegs, Seminole and Searight Pools, excepting that they have regained slightly the loss in production which they experienced during the colder weather.

Southeast Earlsboro

The southeast side of the Earlsboro Pool came into the limelight last week when the Magnolia Petroleum Co.'s No. 1 Moore, NW cor. NE SE Section 24-9-5 found the Wilcox sand productive. This well tapped the sand 4,210-24 feet and the best day's production was 425 bbls. which was made by the swab. The owners swabbed the well steadily but could not lower the fluid level below 2,000 feet. The well has not been shot, and, considering the history of the other wells in the Earlsboro extensions, and also the good column of fluid which the Moore well sustains, it seems that a good shot and the use of the air lift in this well would result in a big well. For this reason the performance of the well is regarded as being exceptionally important, and may result in the drilling up of a pool which will be capable of making 20,000 bbls. daily. It is just one-quarter mile south of the Prairie Oil & Gas Co.'s No. 1 Baker which opened this part of the Earlsboro Pool.

It is noticeable that the majority of the wells in all the Earlsboro extensions were made by heavy shots, and if this operation is to repeat the history of other extensions of the pool, a rich spot will probably be found.

South End of Little River

The south end of the Little River Field is showing additional interest so far as the shallow sands are concerned. This excitement was first originated by T. B. Slick, Inc.'s No. 1 Wood in Section 26-7-6. The latest well to arouse interest in the Gilcrease-Cromwell sand work in this sector is the Shell Petroleum Corp.'s No. 1 Glass, NW cor. SE, Section 26-7-6, and a direct offset to the Slick Wood well. The Glass well found the Gilcrease sand 3,180-3,208 feet, and has a total depth of 3,222 feet. It had a small showing of oil and made 44,000,000 feet of gas. The Gilcrease formation is located above the Cromwell sand, and the Glass well will be produced as a gas well for some time before drilling it down to the Cromwell sand, from which the first shallow sand production of the region was taken.

Maud Extension

The Misener sand region of the Maud territory had an important extension last week when the Skelly Oil Co. and Margay Oil Co.'s No. 1 Lingerfelt, SW cor. NW NE, Section 18-8-5, found the Misener sand 4,130-31 feet and flowed 2,460 bbls. the first full day. The owners now have a fishing job on the well which will delay deeper penetration of the sand temporarily. This well extends the heavy Misener sand production one-quarter mile to the north, and changes the outlook for the territory immediately north of the well.

In the Oklahoma City territory there is slight change in the output of the discovery well, but the finding of another good well in a more shallow sand will mean much to the future of the region. The discovery well is the Indian Territory Illuminating Oil Co.'s No. 1 fee, C SW SW, Section 24-11-3w, which is now making 5,770 bbls. daily and which has a total depth of 6,498 feet. The well which found the shallow oil is the same company's No. 1 Trosper, C NE SW, Section 13-11-3w, which found a sand 3,973-86 feet and made 232 bbls. daily of oil and 5,500,000 feet of gas. This is apparently the same sand in which the discovery well found a good showing of oil which was passed up in favor of the chances of obtaining deeper sand production.

It may develop at Oklahoma City that the deep sand production will attract attention and make the front pages of the papers, and that the shallow sands will make the money for the operators.

Deep Sand Failure

Although the discovery well of the territory is holding its output well, the future of the Allen deep sand production was dealt a blow by the failure of the Sun-Ray Oil Co.'s No. 1 Harjo, NW cor. SE SW, Section 7-5-8. This well which is one-quarter mile south and west of the Sinclair Oil & Gas Co.'s No. 2 Amo in the same section (which opened the pool) is a failure in the Wilcox sand and with a hole full of water found 4,283-93 feet. This may mean that the Allen deep sand operation will be very small in area, and it may also mean that the outline of the pool will take a different course from the discovery well. The Sun-Ray well was especially well located from a geological standpoint, and the finding of water is a sharp disappointment. The Allen deep sand pool may run north or northeast from the discovery well. The Sinclair No. 2 Amo is making 1,750 bbls. daily from the Wilcox sand.

Seminole Runs

The pipe line situation in the Greater Seminole area has changed very slightly. The daily average runs for the week ending Saturday, January 19, follows:

Barnsdall	5,87
Champlin	3,09
Continental	1,33
Consolidated	33
Mid-Continent Pet.	10,87
Empire	9,73
Gulf	29,19
Magnolia	29,27
Oklahoma	46,34
Prairie Pipe	61,69
Pure	2,82
Shaffer	3,82
Shell	9,86
Sinclair	29,85
Texas	14,63
Tidal	13,14
White Oak	2,54
Total barrels	269,39

The tank car shipments out of the field for the same period mentioned above follow:

Amerada Pet. Corp.	2,57
Carter	5,37
Pure	5,30
Total	13,24

The production of the Wilcox sand wells of the St. Louis Pool on Saturday, January 19, follows:

Barnsdall Oil Co.:	
1, 2 and 3 Stahl	1,46
Gypsy-Sinclair et al.:	
1 Stahl	2,49
2 Stahl	2,46
3 Stahl	66
4 Stahl	1,49
5 Stahl	
Gypsy Oil Co.:	
4 Leclaire	39
Interocean Oil Co.:	
3 McGee	9
Phillips Pet. Co.:	
2, 3 and 4 Stahl	65
Sinclair Oil & Gas Co.:	
5 Blandin	23
12 Blandin	

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

LATTIMER COUNTY

Company, farm and location—	Remarks:
Limestone Oil & Gas Co.'s No. 1 McMurray, SW cor. SW Sec. 15-5-18	1,000,000 ft. gas 2,518-20 ft.

GRANT COUNTY

Cowden and others' No. 2 Vollmer, CEL NE SW Sec. 22-25-4w	Shut down 5,640 ft.
Lario-Lathrop's No. 1 Cornell, NW cor. NW Sec. 24-28-3w	Shut down 1,670 ft.

HARPER COUNTY

Hoffer Oil Co.'s No. 1 Cooper, NW cor. SE SE Sec. 12-25-22w	Shut down 4,130 ft.

KAY COUNTY

Geo. L. Miller and others' No. 1 Home, NW cor. SE Sec. 11-24-3	Dry and abandoned at 4,031 ft.
Lario Oil Co.'s No. 1 McKay, NW NE Sec. 14-29-1	Dry and abandoned 3,890 ft.
Wentz Oil Corp.'s No. 1-A Ward, C NW SE SW Sec. 32-27-1e	Drlg. 440 ft.

WOODWARD COUNTY

Otstot Development Co.'s No. 1 Simmons, SE cor. SE Sec. 32-24-17w	Dry and abandoned 1,490 ft.
Sharon Oil Co.'s No. 1 Elmore, SW cor. SW Sec. 25-21-21w	Rig blown down, 3,025 ft.
Billy's Oil Co.'s No. 1 Watt, C SE Sec. 9-23-20w	Casing 1,553 ft.
Burgoyne Brothers' No. 1 Merkins, SW cor. SE NE Sec. 15-21-19w	Cleaning out 1,910 ft.
Farrond and others' No. 1 Johnson, SW cor. SW Sec. 1-23-17w	Underreaming 1,560 ft.

GARFIELD COUNTY

E. L. Love and others' No. 1 White, SE cor. NW Sec. 9-24-6w	Shut down 4,755 ft.
Marland and Barnsdall's No. 1 Looman, NE SE Sec. 9-20-4w	Dry and abandoned 5,735 ft.
Marland Oil Co.'s No. 1 Miller, SW cor. SW Sec. 12-20-4w	Dry and abandoned 4,575 ft.

NOBLE COUNTY

Alco Royalty Co.'s No. 1 Waltermire, SE cor. NW Sec. 33-21-1w	Underreaming 2,308 ft.
Marland Oil Co.'s No. 1 Kidd, NW cor. SW Sec. 32-20-1w	Shut down at 5,290 ft.; plugging back to show oil 1,836 ft.

KINGFISHER COUNTY

McKinney & Crawford's No. 1 Sturgeon, NE cor. SW Sec. 27-16-6w	Drlg. 4,870 ft.

LOGAN COUNTY

Haley & Smith's No. 1 Guier, SE cor. SW Sec. 33-18-3w	Shut down 3,970 ft.
J. L. Donahoe's No. 2 fee, SW cor. NW SE Sec. 21-18-2w	Preparing to plug 6,022 ft.

BLAINE COUNTY

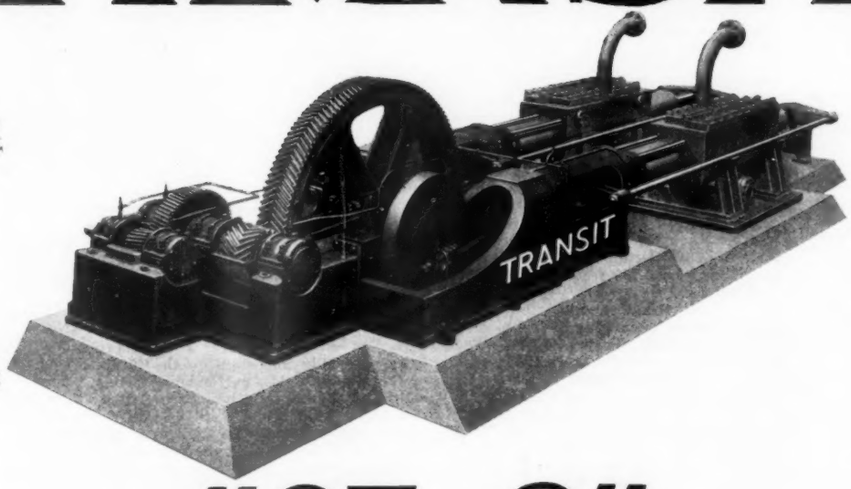
Lowen and others' No. 1 Unknown, NW cor. SW NW Sec. 27-16-11w	Spudded and shut down; renewing leases.
W. J. Donnelly, trustee's No. 1 Dickens, NE cor. SE Sec. 26-15-12w	Drlg. 4,405 ft.
Ragland and others' No. 1 Unknown, C NW SW Sec. 13-19-10w	Rig.

LINCOLN COUNTY

Phillips Pet. Co.'s No. 1 Stephens, SE cor. NW Sec. 29-12-3	Rig.
Morgan & Flynn's No. 1 Finlay, SW cor. SW Sec. 19-16-6	Location.

(Continued on Page 111)

Thirty two of these TRANSIT



HOT OIL PUMPS

For One

KELLOGG

Refinery.... Installation

National Transit Pump & Machine Co.

OIL CITY, PA.

NEW YORK CLEVELAND PITTSBURGH PHILADELPHIA

LOS ANGELES TULSA HOUSTON

13 Blandin	2,365
1 Nadash	180
Magnolia Pet. Co.:	
1, 2, 3 and 4 Hembree	3,896
1, 3, 4, 5, 6 and 7 H. E. Youts	4,496
2 C. A. Youts	520
1 T. Fyke A	95
1 T. Fyke B	3,597
1 Cherry A	743
T. B. Slick, Inc.:	
1, 2, 3 and 4 Hembree	11,640
2 and 3 Youts	1,160
2 Davis	*3,690
Mid-Cont. Pet. Corp.:	
1 Guinn	0
Pure Oil Co.:	
1, 2 and 3 Thomas	13,680
Independent Oil & Gas Co.:	
1, 2, 3, 4, 5, 6, 7 and 8 Youts	19,680
Prairie Oil & Gas Co.:	
1, 2, 3 and 4 Wolf	3,460
Shell Pet. Corp.:	
1 Smith	145
Shaffer Oil & Ref. Co.:	
1, 3 and 4 Cherry	3,132
Texas-Fuhrman:	
1, 3 and 4 Cherry	7,580
Total barrels from 62 wells	91,004

*Cut 4 per cent.

Beckham County

Sayre Oil & Refining Co. has the rig up for No. 1 Porch, SW cor. NW SE. Section 24-9-23w. Magnolia Petroleum Co.'s No. 2 Davis, SW cor. NW SE, Section 21-9-23w, was completed for 42,000,000 feet of gas in broken sand at 2,269-2,739 feet.

Carter County

Magnolia Petroleum Co. has built the rig for No. 6 C. Lewis, NW cor. NE NE. Section 23-1s-3w. The rig is under construction for No. 3 Denny, NE cor. Section 30-1s-3w. No. 1 Putman, NW cor. NE SW, Section 30-1s-3w, is a rig. Material for the rig is on the ground for No. 6 E. Hefner, NW cor. NE SW, Section 33-1s-3w. H. L. Sturm has the rig up for No. 2 Fish, SW cor. NE SW, Section 35-3s-2w. Magnolia Petroleum Co.'s No. 1 Ratliff, NE cor. NW NW, Section 29-1s-3w, made a 50-bbl. well in sands at 2,666-3,207 feet.

Creek County

J. H. Winemiller's No. 1-A Colbert, SW cor. SE, Section 9-19-7, is drilling at 320 feet. The Dixie Oil Co.'s No. 5 Tahkaney, SE cor. SW SE, Section 7-19-9, is drilling at 930 feet. H. U. Bartlett has the rig up for No. 2-B Sewell, SW cor. NW NE, Section 18-19-9. Silurian Oil Co. made location for No. 26 Starr, SW cor. SE SE, Section 8-18-7. Schermerhorn Oil Co.'s No. 1 Barker, SE cor. NW NW, Section 14-18-10, is drilling at 600 feet. B. C. Burnett's No. 1 Fife, NE cor. SW SW, Section 28-18-11, is drilling at 250 feet. Lynch and others' No. 1 Brown, NE cor. SW NW, Section 4-18-12, is a machine rigging up. Pontiac Oil Co. made location for No. 11 Fulson, NE cor. SW SW, Section 13-17-10. Jackson & Wise's No. 3 Sapulpa, C NW NE, Section 3-17-11, is shut down at 1,826 feet.

Curtis Oil Co. has a machine on the location for No. 1 McIntosh, NW cor. SW NE, Section 13-17-11. Roxaline Oil Co.'s No. 2 Boling, C SW SW, Section 27-17-12, is rigging up. L. Emery made location for No. 1 Comus, C SW SW, Section 4-16-9. Nowata Oil & Refining Co.'s No. 1-A Sethel, SE cor. SW SW, Section 9-16-9, is fishing at 450 feet. C. O. Buckles' No. 1-A Frank, NW cor. SW SW, Section 18-16-13, is rigging up. Shell Petroleum Corp.'s No. 1 Byrd, NE cor. NW NW, Section 15-15-8, is preparing to deepen from 3,220 feet. Pennock Oil Co.'s No. 20 Clinton, CEL NE SW, Section 15-15-10, is drilling deeper at 3,202 feet. C. G. Tibbens moved the rig out for No. 3 Brown, CNL NE NW, Section 9-14-10.

Kingwood Oil Co. and others' No. 1 Deere, SE cor. SW, Section 6-19-7, made 200 bbls. from sand at 3,130-79 feet. Dixie Oil Co.'s No. 4 Tahkaney, NE cor. SW SE, Section 7-19-9, was completed for 750,000 feet of gas in sand at 2,078-2,100 feet after plugging back from 2,895 feet. The Prairie Oil & Gas Co.'s No. 1 Hall, NE cor. NW NW, Section 7-19-7, has been abandoned at 3,194 feet. Sand Springs Home's No. 28 Atkins, CWL NW NW, Section 4-18-7, made 25 bbls. from sand at 2,544-2,658 feet after it was plugged back from 2,769 feet. Roach and others' No. 3 Beavers, SE cor. NW NW, Section 35-18-9, made 15 bbls. from sand at 1,936-54 feet.

Central Commercial Oil Co.'s No. 1 Hay, NE cor. NW SW, Section 10-17-10, made 3,500,000 feet of gas from sand at 2,009-13 feet. Pontiac Oil Co.'s No. 6 Fulsom, NE cor. SW SW, Section 13-17-10, was completed for 7 bbls. in sand at 1,889-1,902 feet. Fox & Irelan's No. 2 Goody, C NW NE, Section 25-17-10, made 20 bbls. in sand at 1,922-47 feet. G. Collins' No. 1-A Townlot, SW cor. NE NE, Section 3-17-11, is a 10-bbl. well in sand at 1,822-25 feet. Peters Petroleum Co.'s No. 4 Arsayalee, SW cor. NE NE, Section 21-16-8, was completed for 150 bbls. in sand at 3,141-53 feet. Flynn & Morgan's No. 1 Ralston, NE cor. NW SW, Section 1-16-9, has been abandoned at 3,310 feet.

O'Rourke Brothers and others' No. 1 Sewell, SE cor. SW NW, Section 4-16-9, is dry and abandoned at 3,542 feet. Magnolia Petroleum Co. and F. R. Billingslea's No. 2 Wattie, NE cor. Section 6-15-7, is a dry hole at 3,710 feet. Twin State Oil Co.'s No. 1 Barnett, NW cor. NE NW, Section 15-15-8, made 20 bbls. from sand at 3,811-17 feet. C. G. Tibbens' No. 3 Carmen, NW cor. SE NW, Section 29-15-9, made 3,000,000 feet of gas in sand at 2,620-60 feet after plugging back from 3,056 feet. Shaffer Oil & Refining Co.'s No. 3 Long, NW cor. NE NE, Section 6-14-9, made 90 bbls. from sand at 3,688-3,708 feet.

Cotton County

Shasta Oil Co.'s No. 3 Chambers, NW cor. SW SE NW, Section 2-2s-10w, is rigging up rotary tools. Cullum & Perkins' No. 5 Priddy, SW cor. NE SE NE, Section 3-2s-10w, is drilling at 1,100 feet. Razor & Akins' No. 1 Chambers, NW cor. SE SW, Section 35-1s-10w, is dry and abandoned at 2,202 feet. Shasta Oil Co.'s No. 3 Chambers, NE cor. SW NW, Section 2-2s-10w, made 34 bbls. from sand at 2,164-67 feet.

Grady County

Oklahoma Gas Utilities Corp. made location for No. 1 Gann, NW cor. SE, Section 8-5-8w. No. 5 School Land, NW cor. SW NW, Section 36-5-8w, was completed for 37,000,000 feet of gas in sand at 2,160-2,400 feet.

Grant County

Argo Oil Co. is building the rig to deepen No. 2 Howell, SE cor. SW SW, Section 14-27-3w, Deer Creek area.

Kay County

Carter Oil Co. and Ona Oil Co.'s No. 1 Mefford, C SE NW, Section 18-29-1, is dry and abandoned at 3,774 feet. Tidal Oil Co.'s No. 4 Cole, C NW SE, Section 18-29-1, has been abandoned at 3,575 feet. D. Early and others' No. 2-A Gaylor, CNL SW, Section 19-27-1w, is dry and abandoned at 3,550 feet. Mummert Drilling Co. and others' No. 1 Weedin, NE cor. SW SW SW, Section 34-27-3, is dry and abandoned at 1,896 feet.

Kiowa County

Ridgeway and others made location for No. 1 Lynn, CWL SW SE, Section 7-6-16w. J. R. Travis' No. 1 Hobbs, CWL NW SW, Section 7-6-16w, is drilling at 457 feet. Joe Ray is moving a spudder in for No. 1 Level, SE cor. NE, Section 10-6-17w. Alexander and others' No. 1 Kinhead, NW cor. SW NW, Section 20-6-16w, has been abandoned at 643 feet.

Lincoln County

Texas Pacific Coal & Oil Co.'s No. 1 Fairs, NE cor. SE NW, Section 35-17-6, is dry and abandoned at 3,880 feet.

Oklahoma County

Indian Territory Illuminating Oil Co. made location for No. 2 Trosper, SW cor. Section 13-11-3w, Oklahoma Field. Location for No. 3 Trosper was made in C SE SW, Section 13-11-3w. Location was made for No. 1 Krager, NE cor. Section 23-11-3w. Coline Oil Co. staked location for No. 2 Olds, C NE NW, Section 24-11-3w. Location for No. 3 Olds was made in NW cor. Section 24-11-3w. W. R. Ramsey made location for No. 2 Fortson, C NW NE, Section 24-11-3w. Indian Territory Illuminating Oil Co. made location for No. 2 Bodine, SW cor. NE SE, Section 24-11-3w. No. 1 Fortson, SE cor. NE, Section 24-11-3w, is a location. Location was made for No. 1 Henning, NE cor. SW SE, Section 24-11-3w. Indian Territory Illuminating Oil Co. and Cromwell made location for No. 1 Johnson, NE cor. NW, Section 25-11-3w.

Indian Territory Illuminating Oil Co. made location for No. 1 Watters, NE cor. NW NE, Section 25-11-3w. Loca-

(Continued on Page 124)

HAVERHILL POOL WELLS ATTRACT ATTENTION IN KANSAS FIELDS

By J. L. Dwyer

Staff Correspondent, Kansas Fields

Interest in the Kansas fields waxes warmer all the time. There were several good wells completed in the Haverhill Pool of Butler County last week which temporarily turned the interest from the Sedgwick area so far as completion of new wells is concerned, but Sedgwick still dominates the Kansas activity.

In the Haverhill region the Empire Gas & Fuel Co.'s No. 6 Willetts, NE cor. NW Section 27-27-5, is good for 250 bbls. daily in the Bartlesville sand after a shot of 80 quarts. The sand was found 2,729-72 feet. No. 7 Willetts, SE cor. SW Section 22-27-5, is making 200 bbls. in the same horizon after a shot of 60 quarts in sand 2,731-60 feet. No. 5 B. Hutchinson, NW cor. NE Section 27-27-5, made 350 bbls. after a shot of 80 quarts in sand 2,727-64 feet. These constitute the best producers which have been registered in this territory for some time.

Interest in another section of the State was also crystallized when the Empire Gas & Fuel Co.'s No. 1 Seiderman, SE cor. NE Section 12-19-2, Marion County, was drilled deeper after being a failure in the chat and found what is believed to be the Viola lime 2,823-25½ feet. The hole filled up rapidly with oil and was swabbed down while the owners cleaned out the well. They are now handling some casing, and the well is estimated good for 500 bbls. when completed and put on the pump. The gravity of the oil is 33.4 degrees A.P.I.

The Empire Seiderman well is a direct offset to the discovery well of Courtney B. Davis, who drilled No. 1 Rample, SW cor. NW Section 7-19-3. The Davis well found oil in the chat at 2,400 feet, and when the Empire missed production in that horizon its Seiderman well was drilled to the deeper stratum. The discovery of oil in this level at Hillsboro is exceptionally important to the future of the Kansas fields, particularly to this sector which was first brought to attention by the finding of oil in the chat.

One rather important feature of the new Empire find is that the majority of geologists believe the deeper production is coming from the same formation which produces the oil at Peabody and Florence Pools, and for this reason there is an unusual interest in this operation.

Sedgwick Region

In the Sedgwick County region there is little news regarding new wells, but, considering that about 15 wells are within 200 to 300 feet of pay sand, the Wright Pool should afford much interesting information during the next two weeks. The well which will probably reach the next is Hayes & Reynolds' No. 1 on a tract in Section 7-26-1e. This is now drilling at 3,120 feet and is reported running higher than the discovery well of the pool.

The Mary Jane Oil Co.'s No. 1 Fitch in the "Golden Triangle" of the SW Section 6-26-1e was put on the pump and is producing from 1,000 to 1,400 bbls. daily by this method. On the northwest side of the Wright Pool the Aladdin Oil Co. and T. B. Slick and others' No. 1 Smyser is also on the pump. No full 24-hour record of this well's pumping is available, but it looks good for 600 bbls. daily when it shall have been completed.

There is one outstanding feature of the wells of the Sedgwick area and that is the steady output they register. There seems to be very little variation in the production, and the wells in the section around the discovery well are free from any water or b.s. content. The daily average output of the wells in this operation for the week ending Saturday, January 19, follows:

Gypsy-Marland & Bu-Vi-Bar:	
No. 1 Wright	1,12
No. 1 Lyons	1,15
No. 2 Lyons	70
No. 1 Lantz	75
Marland Prod. Co.:	
No. 1 Goodrich	*1,70
Mary Jane Oil Co.:	
No. 1 Fitch	1,12
Aladdin-Slick et al:	
No. 1 Smyser	70

*Cutting 5 per cent; 1 per cent water and 4 per cent b.s.

The well of the Aladdin Oil Co., Slick and others has had much down time during the week, and this figure hardly represents a true gauge of the production.

Butler County

Morgan and others made location for No. 1 Nelson, SE cor. NW, Section 8-26-7. Allison & Fitzwilliams made location for No. 3 Pierce, SW cor. NE NE, Section 28-25-4. Rosenthal and others' No. 12 Schaffer, NE cor. SW SE, Section 4-27-6, has been completed for 150 bbls. in sand at 3,148-60 feet. Amerada Petroleum Corp.'s No. 1 Bolin, SW cor. SE NW, Section 36-26-6, is dry and abandoned at 3,248 feet.

Cowley County

Shawver and others' No. 1 Vaught, SW cor. Section 24-31-3, is drilling at 2,600 feet. Cameron and others' No. 1 Zirkle, SE cor. SW NE, Section 31-31-3, is a rig under construction.

Elk County

Croft & Hunt's No. 1 Moline Townsite.

(Continued on Page 124)

KANSAS WILDCATS

BARBER COUNTY

Company, farm and location—	Remarks:
Barbara Oil Co.'s No. 1 Blunk, C NE NW Sec. 20-34-13w	2,000,000 ft. gas 4,755 ft.; fishing tools.
Rolland et al's No. 1 Pickens, NE cor. NW NE Sec. 27-30-14w	Shut down 4,223 ft.

BARTON COUNTY

Everett & Wiley's No. 1 Ward, NW cor. SW Sec. 12-20-13w	Shut down 3,948 ft.
Mid-West Exploration Co.'s No. 1 Karst, SW cor. SW Sec. 11-16-15w	Fishing 3,050 ft.

BUTLER COUNTY

LaRobb et al's No. 1 Bronsenger, NE cor. SW Sec. 24-27-3	Rig.
Swartz et al's No. 2 Randall, NW cor. NE NW Sec. 22 24-4	Shut down 2,605 ft.

CHASE COUNTY

Griener & Fowler's No. 1 Carson, NE cor. NE Sec. 9-21-7	Shut down 3,162 ft.

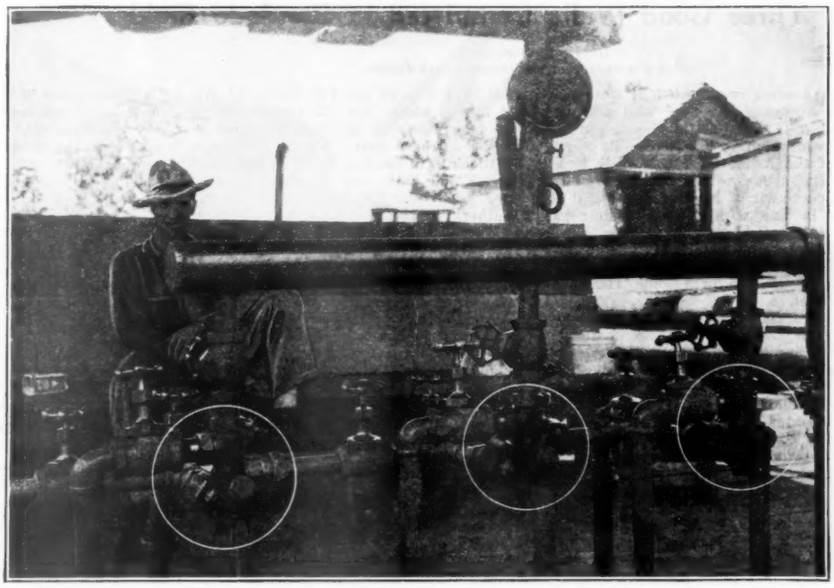
COWLEY COUNTY

Roth & Faurot's No. 1 Ridding, SE cor. NW Sec. 31-32-6	Drlg. 2,600 ft.
Shell Pet. Corp.'s No. 1 Galley, NE cor. NW SW Sec. 18-35-3	Drlg. 2,190 ft.
Pyle & Sutter's No. 1 Lindstrom, SW cor. NE Sec. 9-35-4	Drlg. 2,215 ft.
Empire-Marland-Twin States' No. 1 Feaster, NW cor. NE Sec. 36-32-5	Plugging back to shoot show oil 3,165 ft.
Crow & White's No. 1 Powers, C NW NE Sec. 9-32-5	Sand 714-734 ft., 1,000,000 ft. gas
J. B. Markey's No. 1 Tatum, SE cor. SW Sec. 11-31-6	Shut down 520 ft.
Wakefield & Osborne's No. 1 Osborne, NW cor. NE Sec. 18-30-5	Rig.

ELLIS COUNTY

Rush Oil Co.'s No. 1 Gatewood, NW cor. NW Sec. 4-15-20w	Shut down 1,100 ft.
Transcontinental Oil Co.'s No. 1 Boetcher, NW cor. SE SW Sec. 21-13-19w	Fishing 3,858 ft.
Finney & Weiner's No. 1 Freeman, SE cor. SW Sec. 24-15-20w	Spudded and shut down.
Labette Oil Co.'s No. 1 Urban, NE cor. NW NW Sec. 19-15-16w	Drlg. 3,560 ft.
Atlantic Oil Prod. Co.-D. B. Mason's No. 1 Gorham estate, C SE SE Sec. 35-15-16w	Drlg. 2,462 ft.

(Continued on Page 106)



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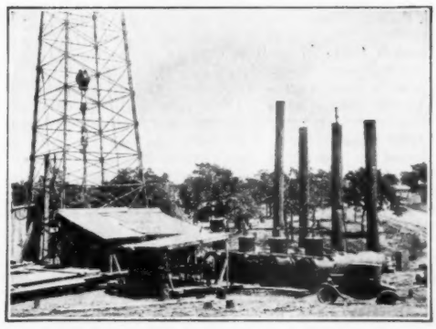
Magnolia Petroleum Co. rotary drilling rig in Maud District, Oklahoma



Joe Bruner Production to 15,000 Bbls.

New Sand Found in the Agua Dulce Field in Eastern Nueces County. Three Good Wells Completed in Randado Field

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Jan. 21.—A number of completions in the Joe Bruner-Salt Flats Field at Luling in Caldwell County have put the production of that field up to around 15,000 bbls. On a one-day gauge recently it gauged 14,670 bbls. in 24 hours. About one-half of the production belongs to the Gulf Production Co. which has completed six wells on the W. L. Smith lease, four on the Connelly and two on the J. J. Davis in the heart of the field. Thus far operators have drilled only necessary offsets and while there are about 45 additional operators listed and a number of these on the sand and due in, the demand for offsets is not likely to be quite so pressing now unless more territory is added and something new is started. Outside locations have been drilled in the past and operators can now take more time at inside locations.

The Shell Petroleum Corp., which got a little oil in its No. 1 Carter, midway between the Humble's No. 1 Johnson on the northeast end of the field and the nearest production on the southwest, has finally abandoned the well as too small.

Golden West Oil Co. has abandoned its No. 1 Cook at the south end of the field. It made about 2 bbls. of oil and considerable water when 84 feet in the Edwards lime at total depth of 2,763 feet. It was a little too far east. Golden West is still working with No. 1 Malone which made a gas well at 1,158 feet. It has been bridging and the company is trying to set a liner. No. 2 Malone, 74 feet southwest of No. 1 is in the Edwards lime topped at 2,712 feet and total depth 2,732 feet and it is being put on the pump. It will probably make a well. It is about 1,200 feet southeast of the Shell Petroleum Co.'s No. 1 J. J. Davis, a producer and the farthest northwest which indicates a width of about five locations at that part of the field.

Humble Oil & Refining Co. had a fishing job in its No. 2 Johnson at the northeast end of the field and a little west of its No. 1, at about 1,070 feet. This well is of considerable interest. According to the geology as worked out it should be a bigger well than No. 1 Johnson and, if it is, it will prove the theories and make the field from that well to the nearest producers look good.

Smilox Oil Co. has a steel derrick up and is moving in machinery to drill on the Robinett land half way between the Bruner and the old Luling Field and in the southeast corner of the Dykes Survey and has a location made in the southeast corner of the Barnett Survey 3 miles northeast. There is considerable play along this line in the theory of a structure.

New Agua Dulce Sand

A new sand was found in the Agua Dulce Field in western Nueces County the past week in the Agua Dulce Oil & Gas Co.'s No. 1 Sanders which is about a half mile southwest of the discovery well and with one other gas well between. The regular sand in the discovery well was at 2,013 feet and in No. 1 Sanders at 1,971 feet awith the tools 7 feet into the sand at total depth of 1,978 feet. On a drill stem test it looked like it would be as big a gas well as the discovery well which gauged 100,000,000 feet. The new sand is green and rather fine and was passed up in other wells, thinking it was too fine. It will not be passed up again if it makes a well. There is also a sand at 1,600 feet, that showed some gas in other wells, that has never been tested, it is remembered now, and the next well will test it. R. & G. Corp. is moving in on No. 1 Brown which is is a half mile northeast of the Agua Oil & Gas Co.'s No. 1 Sponberg, a gas well at 2,020 feet and 2 miles northeast of No. 1 Sanders and directly in line with the other four gas wells of the field.

Refugio Field

In the Refugio Field, Saxet Gas Co. completed its No. 5 Claude Heard at 3,709 feet, a big gas well spraying oil and with a rock pressure of 1,500 pounds. Volume is not gauged but, estimated on a comparison of other wells in the field, it is probably about 65,000,000 feet. Two other wells at the north end of the field, Union Exploration Co.'s No. 1 Holmes Heard and Union Exploration Co. and William F. Morgan's No. 2 Adkins in the same sand were being brought in late in the week with the chance that each would be a big oil well.

Randado Pool

In the Randado Pool in Jim Hogg County, accounted by many the best pool ever found in the Laredo district, but which has been quiet for some months, being thought about drilled up, Randado Oil Corp. of Oklahoma City has completed three good wells and is drilling others. The wells are on the east edge of production and so extend the field a little. No. 27 Palacious came in for 125 bbls. and No. 28 for 100 bbls. and No. 26 for 60 bbls. Nos. 27 and 26 are in the lower part of the field and No. 28 in the northern part. No. 25 Palacious, in Block 9, in sand at 1,270-76 feet came in for 350 bbls., one of the best wells ever drilled in the field. It is in the southern part of the field, 400 feet west of the east line and 150 feet south of the north line of Block 19, Survey 291, and the No. 29 is spudded in in the southeast corner of that block.

New Pools

For the first time in weeks the two important pools in the Laredo territory, the Albercas and Cole Petroleum had no completions last week and no extensions. Sun Oil Co. is testing its Nos. 12-A and 13-A, which are offsets to the Rycade Oil Corp.'s Nos. 8 and 9 and these wells complete the drilling of the Sun and Rycade towards the south as they have reached the limit of their leases. A. W. Majors has made a location offsetting the Rycade's No. 9 on the south and Edwards St. Albans estate has made location for a well in the northwest corner of Block 7, Share 3, located 300 feet east of the Majors location but neither has spudded in.

In the Magnolia-Cole Pool the activity is now all in the territory north and northeast of the oil production due to J. J. O'Hern getting a big gas well 2 miles north and the Houston Gulf Gas Co. a big gas well 1 mile east and 1 mile north of oil production. Seven wells are now listed in that territory. The Magnolia has three started, one a mile and another a half mile north of the O'Hern well and one offsetting on the west the Houston Gulf Gas Co.'s well. William F. Morgan is starting a well a quarter mile east of the Houston Gulf Gas and Union Exploration Co. a well a half mile southeast of the O'Hern well. Houston Oil Co. is starting a well a half mile north of oil production. Besides these, Cole Petroleum Co. is starting in the field the No. 67 Benavides, 300 feet east of one of their producers and Houston Oil has three locations in the old field.

Completions

Caldwell County

J. S. Abercrombie Oil Co.'s No. 5 Lida Moses, A. Floyd Survey, Bruner Field, completed at 2,724 feet making 150 bbls. initially on the pump.

Gulf Production Co.'s No. 5 W. L. Smith, 300 feet north of the No. 4, Bruner Field, has been completed at 2,691 feet, initial production 200 bbls. by heads.

Humble Oil & Refining Co.'s No. 1 J. B. Tiller, Bruner Field, completed at 2,712 feet, made initial production of 100 bbls. by heads through 2½-inch tubing.

Humble Oil & Refining Co.'s No. 2 J. B. Tiller, same field, completed at 2,722 feet, made 200 bbls. through 2½-inch tubing, 2½ per cent water.

Humble Oil & Refining Co.'s No. 2 W. F. Davis, same field, at 2,708 feet, has been completed, initial production 130 bbls. on the pump.

Shell Petroleum Corp.'s No. 1 Floyd Tiller, G. Hinds Survey, same field, completed at 2,700 feet for 100 bbls.

Shell Petroleum Corp.'s No. 1 R. W. Carter, Gerren Hinds Survey, same field, has been completed at 2,697 feet, swabbed a little oil and was first reported as producer, later casing was pulled and test is being abandoned.

Shell Petroleum Corp.'s No. 1 William Moses, A. Floyd Survey, same field, completed at 2,699 feet for 574 bbls. initial production.

Golden West Oil Co.'s No. 1 Wilson, A. Floyd Survey, same field, completed at 2,692 feet for 200 bbls. on beam, pumping.

Shell Petroleum Corp.'s No. 5 William Smith, A. Floyd Survey, same field, has been completed at 2,626 feet, flowing about 1,200 bbls. daily.

Duval County

The Texas Company's No. 2 Hahl, Survey 250, Block 18, Schoolfield & O'Byrne Field completed at 2,348 feet, flowing 140 bbls. daily.

S. & O. Oil Co.'s No. 1 Hahl, Survey 250, Block 23, same field, completed at 2,365 feet 75 bbls. of oil and 300 bbls. of water.

Refugio County

Saxet Gas Co.'s No. 5 Claude Heard, 550 feet east of the No. 4, has been completed at 3,709 feet a large gas well with 1,500 pounds rock pressure, volume not gauged, but an enormous well, spraying oil.

Webb County

O. W. Killam's No. 3 (L) Bruni, Survey 9, Cole gas field, Bruni Subdivision, at 2,300 feet blew out while testing, blowing out plugs, estimated good for 30,000,000 feet and lubricating to set liner.

Zapata County

O. W. Killam's No. 10 Cuellar, Cerrito Blanco grant, Jennings Field, has

(Continued on Page 121)

SHOWINGS IN AUSTIN CHALK WILL BE TESTED IN SOUTHWEST TEXAS

By B. D. Stevenson

SAN ANTONIO, Tex., Jan. 21.—Three wildcat wells were waiting to test showings in the Austin chalk the first of this week and since the discovery of good production in the chalk in the Joe Bruner-Salt Flats Field at Luling and with Edwards lime production below it, showings of oil in the Austin have considerably greater significance than they did before. All of the wells are within 15 miles or so of Luling. Miller Brothers' No. 1 Gib Springs, 4 miles south of Seguin in Guadalupe County topped the Austin chalk at 1,980 feet and drilled 7 feet in and got a pronounced showing on the ditch with considerable gas. Casing was being set last Saturday at about 1,955 feet. Early this week it will resume drilling and drill through the chalk of which there is normally about 200 feet, and may shoot the chalk. The owners are confident they will get a well.

J. J. Christie's No. 1 Taylor Thomas in Guadalupe County, 11 miles northeast of Seguin, as previously reported in The Oil and Gas Journal has a showing of oil in the Austin chalk at total depth of 1,053 feet with the top of the Austin at 907 feet. Casing was set more than a week ago and the well was expected to drill in Sunday and test.

The third well showing in the Austin is east of Lockhart in Caldwell County where S. M. Oil Co.'s (Walker Brothers) No. 1 Lynch has set casing to test a showing at 1,832 feet. The well is in the Dorothy Benton Survey, 300 feet from the south and west lines of the Lynch farm.

Shell Petroleum Corp. has a steel derrick up and is rigging up on the Charles A. Grein farm, 1½ miles west of the Miller Brothers' No. 1 Gib Springs in Guadalupe, and Simms has a steel derrick up and moving in machinery 2½ miles west of Seguin and 6 miles northwest of the Miller Brothers' No. 1 Gib Springs. T. H. Poole's (Eugene Sights) No. 1 Woehler, 4 miles east of Seguin and 5 miles northeast of Miller Brothers' No. 1 Gib Springs, has been standing for some months after having rigged up. Last week it started making hole.

Miller Brothers' well is about 14 miles southwest of the nearest production in the old Luling Field and on a direct line with the trend of that field and Poole's location is on a direct line between them. This whole territory has been drilled over several times since the bringing in of the old Luling Field 6 years ago and wildcat tests drilled in this area have had good showings of oil. C. N. White's No. 1 Gib Springs, 600 feet northwest of Miller Brothers' test had a showing that for some time looked like it would make a well. Hence the area is not new to the industry.

Other Wildcat Activity

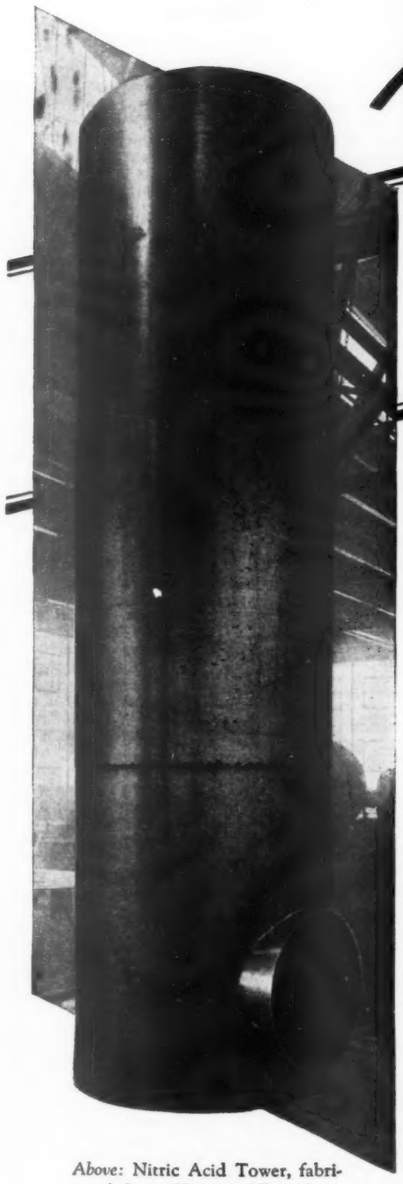
In Bastrop County, the Gypsy Production Co.'s No. 1 Lottman estate which has been shut down at 2,146 feet for some months has resumed drilling.

Two more tests are to be made in the territory in northwestern Caldwell near the spot where the Shell Petroleum Corp. opened a little pool of a dozen wells 2 miles west of Lockhart in the Edwards lime. Bartlett Brothers' No. 2 Martindale, 1½ miles southwest of the Shell's wells, is one of the tests. It is 750 feet southeast of No. 1 Martindale. No. 2 is now down 1,622 feet and got the top of the chalk at 1,190 feet. Whittington and others, who drilled No. 1 Harper about 6 miles southwest of the Roxana Pool, is moving in machinery for a test on the J. G. Horner land in the Francis Berry Survey, a little over 2 miles southeast of the Roxana Pool.

Brooks County

American Maracaibo and W. G. French will drill a number of tests on a big block of acreage in Brooks County which is the county next east of Jim Hogg in the southern part of the State. Brooks has had some good geology worked out

(Continued on Page 117)



Above: Nitric Acid Tower, fabricated from Chrome Alloy plates by means of electric welding. These all-welded tanks are being produced by Industrial Welded Products Co. Inc., Newark, N. J., who use Wilson Machines exclusively.

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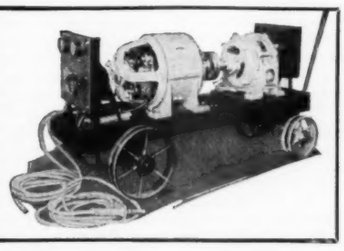

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Importance of Fannette Dome Proven

Gulf Production Co.'s No. 2 Burrell, Flowing 1,500 Bbls. Daily, Indicates Potential Production of That District

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Jan. 21.—That important coastal production exists at the Fannette Dome in western central Jefferson County was proved the past week by Gulf Production Co.'s No. 2 Burrell which blew in with an initial flow estimated as high as 3,000 bbls. daily. The well might be called the discovery well at Fannette, as the first well, completed last August, pumped a small amount of oil daily for only a few weeks.

The Fannette well was the only development of note in the coastal territory during the week and it figured prominently in the news by catching fire soon after it blew in early in the week and burning until Friday. The well, although estimated variously up to 3,000 bbls. daily when it blew out, was flowing at the rate of 1,500 bbls. daily Saturday but even at the latter figure the well is an important development in view of the indications of future prolific production.

The fire was one of several well fires on the Gulf Coast recently. A heavy gas pressure made the blaze difficult to extinguish and fire fighters were hampered in getting into the well by the rain-soaked field. The well blew out while coring in the sandy shale at a total depth of 5,617 feet after drilling plug to test the sand topped at 5,607 feet. The fire is thought to have been started by the wind blowing the gas into the lighted boilers.

The No. 2 Burrell is 600 feet to the southeast of the No. 6-A Bordages, the well completed last August pumping approximately 50 bbls. net oil initially. The No. 6-A Bordages, however, dropped off rapidly and in a few weeks was dry. The No. 2 Burrell is the first test put down since the completion of No. 6-A Bordages well. Production in the latter was from a somewhat shallower sand at 4,775 feet.

Fannette is approximately 20 miles to the west and some south of the famous Spindletop Field and is in one of the most unpopulated and desolate sections of the extreme southeastern part of Texas. The dome was checked in 1925 by the Gulf Production Co. using the seismograph and thus is one of the oldest geophysical domes on the coast. Nearly a score of wildcats have been drilled at various locations on and around the dome.

Watching Vacuum Oil Co. Test

As the week closed operators were watching for possible developments on Vacuum Oil Co.'s dome at Roanoke, Jefferson Davis Parish, where the company's first test was setting screen to test an oil sand at 4,188-4,200 feet. This test, No. 1 DeVilbiss, Section 14-9s-4w, although it may prove a well at this depth, has a sand of considerable importance from a wildcat standpoint with indications that there is a field somewhere in that district.

Another interesting wildcat showing encountered was on the Needville Dome prospect in central Fort Bend County. This is in South Texas Petroleum Co.'s No. 1 Hartfield, in which 6⅝-inch casing has been cemented around 4,980 feet to test at a total depth of 4,985 feet.

Needville, like Roanoke, is a salt dome prospect checked by geophysical instruments only during 1928. It was found By Meyer & SoRolle with the torsion balance. This firm controls virtually all the acreage around the prospect with South Texas Petroleum Co. having an interest in connection with arrangements for developing it. Except for a junked hole drilled several years ago, 200 feet south, no other tests ever have been put down anywhere for miles around. The showings at Roanoke and Needville have been followed by considerable trading of royalties.

Among completions during the week was a 1,200-bbl. well on the Sulphur Dome of Calcasieu Parish. This was Union Sulphur Co.'s No. 737 fee, which found the pay at a total depth of 3,175 feet. This well is one of few in the Gulf Coast which have drilled through salt and into other formations below. In drilling this test, 21 feet of salt was passed through at a 2,900-foot level.

Calcasieu Oil Co.'s No. 12 Watkins, East Hackberry Dome, which was completed the latter part of December flowing 950 bbls. daily, and which sanded up, was brought back in the middle of the week flowing 900 bbls. of fluid, 20 per cent water, through a half-inch choke. The old strainer was sidetracked and the test drilled back to the same sand at 3,964 feet.

Gulf Production Co.'s No. 46 Davis, Big Creek, a former well, was deepened to 3,632 feet and was completed for an estimated 2,500 bbls. daily, the largest well, with the possible exception of the same company's Fannette producer, during the week. Navarro Oil Co. and Texas Exploration Co.'s joint No. 10 Dooley at Pierce Junction was brought in flowing at the rate of 400 bbls. of virtually pipe line 27 gravity oil from sand at a total depth of 3,941 feet.

Four in Shallow Sand

Four wells were completed in the shallow sand area on top of the South Liberty Dome. These were Sun Oil Co.'s No. 28 Mitchell, flowing 1,000 bbls. daily of 23 gravity oil, 1,065 feet; this company's No. 27 Mitchell, flowing 675 bbls. at approximately 865 feet; The Texas Company's No. 16 Staiti, flowing 654 bbls., 1,214 feet, and Gulf Production Co.'s No. 4 Marrs McLean, pumping 100 bbls., 862 feet.

Republic Production Co.'s No. 27 Dolbear, Hull, is flowing 500 bbls. daily of 23 gravity oil from sand at 2,287 feet. This is a former well deepened. Yount Lee Oil Co.'s No. 88 McFaddin, Spindletop, came in flowing at the rate of 700 bbls. daily of 25.8 gravity oil at 2,526 feet. Gulf Production Co.'s No. 35 Stateland Oil Co., Goose Creek, and Watts Oil Co.'s No. 8 Blakely, Blue Ridge, made small pumpers, the former being good for 80 bbls. net at 2,527 feet, and the latter 50 bbls. around 2,000 feet.

Another wildcat in the Gay Hill district of Washington County blew out, this being Sun Oil Co.'s No. 3 Grote. No. 1 Witt, which blew out the previous week, catching fire and destroying the derrick and rig, is being rigged up again to deepen. It blew out while drilling at 595 feet. The existence of this shallow gas sand has been felt pretty heavily by this company, which so far has had three blowouts. The discovery well, No. 1 Grote, and the No. 2 Grote, which came in for an initial flow of better than 4,200 bbls. daily, still are shut in until storage facilities can be provided.

Daily average production of coastal fields for the week ending January 19 totaled 139,150 bbls., an increase of 1,248 bbls. over the preceding week. The only particular individual field change of note was at South Liberty where the continual bringing in of four or five wells each week in the new shallow sand area is swelling total daily output of the field until the past week it averaged better than 10,000 bbls. daily.

In Southwest Texas the Bruner (Salt Flats) district, for the first time since it was opened, declined in output, and with the entire Luling district being little changed, the daily average production of Southwest Texas failed to show an important advance. The total daily average was 45,971 bbls. as against 45,953 bbls. of previous reports.

Figures by fields were:

GULF COAST

Texas

Allen Dome	7
Barbers Hill	2,200
Batson	1,319
Big Creek	4,050
Blue Ridge	4,405
Brenham	150
Boling	2,157
Damon Mound	650
DeWalt	6,100
Gay Hill*	
Goose Creek	6,503
High Island	1,023
Hull	9,806
Humble	5,409
Jasper	20
Markham	443
Nash Dome	1,000
North Dayton	640
Orange	3,245
Orchard	14
Pierce Junction	10,756
Raccoon Bend	1,750
Saratoga	958
Sour Lake	2,927
South Liberty and South Dayton	10,155
Spindletop	33,945
West Columbia	7,367
Total this week	117,002
Total last week	115,677
Increase	1,325

*Shut in.

South Louisiana

Anse LaButte	45
Bayou Bouillon	380
Edgerly	869
Evangeline	754
Hackberry	6,092
Lockport	4,344
Sorrento	1,103
Starks	770
Sulphur	2,800
Sweet Lake	900
Vinton	4,601
Welsh	30
Total this week	22,148
Total last week	22,225
Decrease	77
Total Gulf Coast	139,150
Total last month	137,902
Increase	1,248

Southwest Texas

Dale	668
Gonzales	185
Kingsville	289
Luling*	27,466
Lytton Springs	1,129
Refugio	818
Somerset	1,934
Mirando	13,407
Medina County	30
McMullen	45
Total this week	45,971
Total last week	45,953
Increase	18

*Including Bruner, 13,129; Caldwell, 8,460; Guadalupe, 4,305; Larremore, 257; Yoast, 1,315.

Humble—Harris County

South Texas Petroleum Co.'s No. 3 Morris has been rigged up. This is just south of the same company's Nos. 1 and 2 Morris, which opened deep production on the south side of the Humble Field. Material for four other derricks has been moved onto adjoining leases although locations have not been announced as yet by any other company. The Texas Company and the Humble Oil & Refining Co. are two companies which probably will make locations soon.

The Texas Company's No. 22 House is drilling shale, sand and lime at 3,366 feet. The same company's No. 14 Koehler is drilling sand and boulders at 1,761 feet.

Barbers Hill—Chambers County

Humphreys Corp.'s No. 6-B Kirby, third test to reach the deep pay level on the southeast flank of the dome since the completion of Bennett Petroleum Co.'s No. 1 Smith, 4,000-bbl. well, last October, Saturday was coring shale below 5,312 feet and Bennett Petroluem Co.'s No. 1 Means is drilling gumbo at 2,591 feet. Joe Bashara's No. 1 Tarbutton still is delayed by a fishing job with the bottom of the hole at 4,070 feet.

On the southwest flank of the dome, Yount Lee Oil Co.'s No. 1 Chambers is in an oil showing sand at a total depth of 5,112 feet with 6⅝-inch casing cemented at 5,090 feet. This company's No. 2 Richardson which the past week made a few small heads and is standing in oil is being rigged up to pump. It is in a shallow sand at 2,100 feet. A derrick is up for No. 3 Richardson.

South Liberty—Liberty County

In the shallow sand area four more wells were completed during the week and in addition Sun Oil Co.'s No. 24 Mitchell is being rigged up to pump. Gulf's Nos. 5 and 6 McLean, Sun Oil Co.'s Nos. 30, 31 and 32 Mitchell and The Texas Company's No. 18 Staiti are drilling near the pay sand which ranges from 750 feet to below 1,200 feet. Sun is rigging up for No. 34 Mitchell and has derrick up for Nos. 34 and 35. The Texas Company has a derrick up for No. 19 Staiti and Gulf is rigging up for Nos. 7 and 8.

To the north of this shallow area, Empire Gas & Fuel Co.'s No. 1 Goggan is drilling below 1,500 feet and should be in the sand shortly. Liberty Petroleum Co.'s No. 2 Turner still is standing with casing cemented at 1,490 feet and the total depth of the hole at 1,512 feet, where it has an oil showing sand. Painter Oil Co.'s No. 1 Turner is waiting casing cement to set at 725 feet. Liberty Petroleum Co.'s No. 1 Turner, the wildcat discovery, which tests are offsetting, continues to produce a small amount of oil from sand at 1,621 feet.

Sun Oil Co.'s No. 26 Mitchell on the north edge of the east flank production is drilling below 2,657 feet. Yount Lee Oil Co.'s No. 14 Mitchell is in gumbo and lime at 1,375 feet.

Vacuum Oil Co.'s No. 1 Trinity River, on the north side of the dome and a mile from the main part of South Liberty Field, is being delayed by high water, the test being in the river. The rat hole has been dug. The Texas Company's No. 3 Pickett, its offset, is drilling gumbo at 595 feet.

Boling—Fort Bend and Wharton

Gulf Production Co.'s No. 5 Bay, northeast side of the dome, is drilling shale at 3,756 feet. South Texas Petroleum Co.'s No. 1 Fotjek-Hyde is in a hard lime at 3,754 feet and is reaming to set casing. The Texas Company's No. 1-A Dipple is drilling gumbo at 2,378 feet. The latter's No. 1-B Dipple is standing as a derrick and No. 1 Pleasant as a rig. The latter company also has a rig up for its second test on the E. C. Farmer lease towards the southeast flank of the dome. Sun Oil Co.'s No. 4 E. C. Farmer is drilling hard sand at 3,450 feet. Scott & Peck's No. 1 Armstrong is drilling hard sand at 3,674 feet.

Vacuum Oil Co.'s No. 1 Taylor on the south side is drilling lime at 3,100 feet. This company's No. 2 Taylor is drilling gumbo at 2,857 feet.

Blue Ridge—Fort Bend County

Humphreys Corp.'s No. 5 West-Schenck on the south side of the dome is drilling gumbo at 1,740 feet. Superior Oil Corp.'s No. 5 West-Schenck is drilling gumbo at 2,247 feet. South Texas Petroleum Co.'s No. 3 Lafferty, east side, is drilling gumbo at 1,864 feet. Gulf Production Co.'s No. 6 Invincible is drilling gumbo at 1,712 feet, and its No. 14 Luscher at 1,741 feet.

Sheffield, Telshaw & Cady's No. 2 Blakely is drilling sand and boulders at 948 feet.

Big Creek—Fort Bend County

The Texas Company's No. 4 Wheat is

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Magnolia Gets Well in Sarepta District

No. 1 N. Scroggins Is Company's Second Good Producer in That District of Webster Parish. Making High Grade Light Oil

By D. H. Bancroft
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Jan. 21.—Magnolia Petroleum Co. completed its second good well in the Sarepta district of Webster Parish last week when No. 1 N. Scroggins, Section 1-22-11, started pumping 158 bbls. of oil and 18 of salt water from 18 feet of sand at a total depth 2,709 feet. A few weeks ago No. 1 Cook in Section 2-22-11, was put on the beam for 150 bbls. at a total depth 2,711 feet. About the same time, the Northwest Louisiana Gas Co. completed No. 7 Pine Woods, Section 33-23-11, pumping 35 bbls. from 3,041 feet. All three are making a high grade light oil discovered by Lloyd Harris, a Canadian operator, who was active in that locality just prior to the opening of Cotton Valley, who drilled several wells, most of which were gassers or gas wells with a spray of oil.

Two gas wells of large capacity and a failure in the eastern extension were Champagnolle's contribution to the completions records. Olson Brothers' No. 1 Kelly in SE cor. NW SE, Section 9-17-14, made 35,000,000 feet of gas at a total depth 2,806 feet with the bottom in 12 feet of sand, and Rovenger Corp.'s No. 1-B Perdue in SW cor. SE NE of the same section, gauged 43,700,000 feet from 31 feet of broken sand at a total depth of 2,804 feet. Both are from the shallow sand in the gas belt marking the western extremity of Champagnolle's deep sand area.

Pure Oil Co.'s No. 1 Nash in NW cor. NE SE, Section 7-17-13, a quarter mile north of Magna Producing Co.'s No. 1 El Dorado Realty Co. which stretched production a half mile south and east in the eastern extension, failed to get production at the depth of producers north and west and was abandoned in sandy lime at 3,260 feet. It tested salt water with a little oil at 3,048 feet, from around which depth the eastern extension wells are producing.

Lion Fails to Get Production

Lion Oil Refining Co.'s No. 5 Union Sawmill in SW cor. NW NE, Section 7-17-13, half a mile north and a little west of the Pure well, also failed to get production at standard depth, though it is an east offset to Marine Oil Co.'s No. 4 Sample, a good producer. It was dry at 3,076-3,100 feet, salt water with a little oil at 3,138-42 feet, salt water 3,276-83 feet, and again at 3,368 feet. The last report showed it coring at 3,-755 feet at which depth it was one of the deepest, if not the deepest, test yet drilled in the entire Champagnolle district. It probably will go 4,000 feet or deeper before being abandoned.

Dixie Oil Co. abandoned No. 53 Dillon in Section 13-21-15, Pine Island district of Caddo Parish, in lime at 3,757 feet. Deepened from 3,737 feet where it was completed as a 750-bbl. producer in December, 1925, it had been shut down, waiting on standard rig to pump since last June, but the rig had not been built. H. M. Mattson's No. 1 Boisseau, Section 34-21-16, Oil City district, was completed as a 5-bbl. pumper at 2,290 feet. Hartzano Oil Co.'s No. 3 Urania in the SE SE NW, Section 7-10-2e, Urania district of LaSalle Parish, cored the sand at 1,320 feet but got salt water and was abandoned. Humble Oil & Refining Co. added No. 1-D Groves, Section 6-14-20, to its string of Nevada County producers, pumping 20 bbls. from 3 feet of sand at a total depth of 1,158 feet. Its deep test in Section 1-14-20, No. 2 Hein, cored red and gray sand at 2,286 feet.

Gulf Deepening Smackover Well

Besides the deep tests Humble is drilling in the old El Dorado East Field. Gulf Refining Co. is also deepening No. 9-A Goodwin in Section 5-16-15, Union County, Smackover, from 2,379 feet where it was a 250-bbl. producer on completion in August, 1925. No. 2 Gaddy, Section 6-18-14, tested salt water at 3,-143 feet on being cleaned out to deepen, and cored red shale at 3,188 feet, about the same level at which the red beds are found in Champagnolle. J. W. Hooser's No. 4 Slade in SE cor. SW SE, Section 4-17-14, looks like a failure. The lease is on the north edge of Champagnolle deep sand area and has two producers and one failure on the south half of the 20 acres. No. 4 is a north offset to one of these and No. 2 on the west was a dry hole offsetting No. 1, a producer, on the north. No. 4 had 4 feet of sand but when the test was made the hole filled up with salt water at a total depth of 3,239 feet.

H. L. Hunt is drilling No. 4 Gregory in NW cor. SW SE, Section 10-17-14, at 1,480 feet, a new well offsetting Pure Oil Co.'s No. 4 Gregory on the south, and is arranging for a drill stem test on No. 6 Gregory in Section 15-17-14, at 3,070-80 feet. E. C. Johnson (Arkansas Drilling Co.) has picked up 14 feet of sand at 2,769-83 feet in No. 3 E. F. Gregory, Section 10-17-14, and cemented 6⅝-inch casing for a test and may get a gas well.

Oilwell Misses Production

Oilwell Corp.'s No. 2-A Kelly in NW cor. NE NW SE, Section 9-17-14, between two gas wells apparently has missed production in the lower levels as it was dry at 3,257-3,305 feet and had salt water at 3,344 feet where it cemented bottom. When tested for shallow production at 2,819-24 feet it filled 15 fourbles with oil on top of 2 of salt water. Tested again in 10 feet of sand after cementing the 6⅝-inch at 2,714 feet it showed for 40,000,000 feet of gas but went on deeper, testing salt water again at 2,891 feet. Pure Oil Co.'s No. 6 W. E. Gregory, Section 15-17-14, is waiting for orders after a salt water test at 3,226-35 feet. Like the Oilwell Corp.'s No. 2-A Kelly, it had shown for a producer in the shallow sand, testing 28 fourbles of oil and salt water from 3,-060-83 feet. Previous to that it had made a salt water test at 2,635-40 feet.

Magnolia Petroleum Co.'s No. 2 J. Sartor, Section 16-16-6, in the center of the north end of Richland Parish proven area, which tested dry at 2,450 feet, around which depth most Richland gassers are completed, was dry again at 2,-495 feet. Operators do not know just what to make of these tests. Of two other failures in the midst of production, one was a salt water well and the other got the gas at around 2,500 feet after testing dry at 2,450 feet. Magnolia was arranging to take another core at 2,495-2,500 feet. The company made two new locations in the Sarepta-Shongaloo district of Webster Parish and one in Cotton Valley this week; one on the Coyle land in Section 2-22-11, in which section its 150-bbl. producer completed this week is located, and another on the Cook farm in the same section. No. 6 Marshall is the Cotton Valley location, a deep test in the C SW SE, Section 21-21-10.

Daily Average Runs Decline

With every pool in Arkansas showing a decline, four of them measuring the fall in three figures, and only four Louisiana pools showing small gains to offset them, daily average runs from the field for the division this week, totaling 114,-535 bbls., were 1,280 bbls. less than the week before. Louisiana runs totaling 36,-285 bbls. were off 370 bbls., and Arkansas with 78,250 bbls. showed a decline of 910 bbls. Champagnolle fell off 335 bbls. to a daily run averaging 10,-585 bbls. Nevada County, usually varying only a few barrels either way from week to week, went down 150 bbls. to 1,420 bbls. per day. Smackover light was off 175 bbls. and the heavy grades 185 bbls. Haynesville dropped 160 bbls. and Urania 180 bbls. Cotton Valley light oil runs have passed from the list, all the deep Trinity wells producing that grade having gone dead.

Daily average runs from the several pools for the week were:

Louisiana	
Caddo, light	9,050
Caddo, heavy	2,800
Homer	4,060
Haynesville	5,370
Red River-DeSoto	4,085
Elm Grove	610
Bellevue	750
Cotton Valley	3,230
Urania	5,840
Pleasant Hill	490
Total	36,285
Arkansas	
El Dorado	4,910
Smackover, light	6,875
Smackover, heavy	61,760
Stephens	1,000
Nevada County	1,420
Lisbon	1,600
Champagnolle	10,585
Bradley	100
Total	78,250
Both states	114,535
Last week	115,815
Decrease	1,280

GULF ACQUIRES HALF INTEREST IN WILDCAT TEST AND MAY DEEPEN IT

By D. H. Bancroft

SHREVEPORT, La., Jan. 21.—Possibilities that Smitherman & McDonald's community well on the Miller farm in Section 17-23-8, Haynesville district, a wildcat in the sense that it is exploring deeper horizons in a proven field, may go farther than the 4,600 feet for which it was originally scheduled, appeared this week when a half interest in the project was acquired by Gulf Refining Co. With the half interest in the well, which is shut down at 4,243 feet waiting for new core barrel cutter heads, the Gulf also got a half interest in Smitherman & McDonald's producing properties. Consideration was reported at $50,000, Smitherman & McDonald to continue drilling under Gulf supervision to the original contract depth of 4,600 feet, in the event no production is found before then, and the Gulf reserving the right to drill further, at its own expense thereafter should it so elect.

The Bethany gas district of Panola County, Texas, presented a rather unusual occurrence during the week when Eureka Natural Gas Co.'s No. 2 Gulley in the James Matthews Survey, made an estimated 2,000,000 feet of gas on drill stem test in the chalk rock at 1,503 feet. A large part of Caddo's production in the early days came from the chalk, and there has been some production in this formation in the East Texas fields, but this is the first, or one of the very few instances, in which it has indicated a gas well. Casing, 4½-inch, was set at 1,500 feet.

Tests Disappointing

Bienville's two wildcat tests resulted in one failure and a small gas well. W. G. Gray and others' No. 1 Johnson in Section 21-18-6, near Gibsland tested dry and was abandoned at 2,976 feet without showing anything all the way down except a little gas around 2,190 feet where the test was dry. W. P. Wallace and others' No. 1 Ashley, Section 15-16-10, in the Lake Bisteneau gas area, showed for about 5,000,000 feet, cemented 6⅝-inch at 1,980 feet and tested 1,000,000 feet in 20 feet of broken formation, total depth 2,005 feet where it is shut down waiting orders whether to kill and go deeper.

Carleton Drilling Co. has resumed work on No. 2 Stevens in Section 12-11-16, DeSoto Parish, shut down since last May at 350 feet, and set 6⅝-inch casing at 1,100 feet, total depth 1,178 feet, where it claims to have had a little gas from a sandy shale.

Similarly Davis and others' No. 1 Moore in Section 12-11-6, Franklin Parish, shut down at 1,000 feet since November, has been drilled to 1,110 feet where it is arranging to make a drill stem test. The Palmer Corp.'s No. 1 Mitchner, Section 8-19-11, East Carroll Parish, a quarter of a mile southwest of its 51,000,000-foot gasser on the O'Brien land, which had 6⅝-inch cemented at 2,401 feet, bailed dry, total depth 2,404 feet without getting a show in the top of the Nacatoch. It was checking about 54 feet lower than the O'Brien. Arkansas Natural Gas Corp.'s No. 1 Tidwell, Section 29-22-11, Bossier Parish, topped the Nacatoch at 1,790 feet and is drilling at 2,250 feet.

Ashley County's wildcats, inactive since

(Continued on Page 120)

NORTH LOUISIANA

Bossier Parish

Elm Grove—Palmer Corp. set 209 feet of 10-inch on No. 12-B Hodges, Section 25-16-12.

Caddo Parish

Greenwood—Loraine Syndicate is drilling No. 1-D Bryson, Section 18-17-16, at 1,000 feet.

Hosston—Bayou State Oil Co.'s No. 6 Land, Section 22-22-15, is waiting on standard rig to pump, total depth 1,020 feet.

Oil City—W. D. Chew set 12½-inch at 63 feet on No. 8 fee, 760 feet south and 560 feet west NE cor. SW NE, Section 33-21-16. C. G. Gibbins tested salt water at 2,400 feet on No. 1 Gibbins, Section 15-21-16,* and is drilling at 2,-443 feet. Shreveport Oil Corp.'s No. 1 Guy, Section 32-21-15, cemented 6-inch at 2,015 feet, total depth 2,190 feet; No. 3 Muslow, Section 32-21-15, is waiting on standard rig to pump from 1,650 feet, plugged back from 3,000 feet.

Pine Island—Dixie Oil Co. cemented 6¼-inch casing at 3,621 feet on No. 91 Dillon, Section 14-21-15; No. 5 Hobbs, Section 21-21-15, shot formation 1,480-1,673 feet and is cleaning out; No. 3-B Wells, Section 21-21-15, shot formation 1,684-1,745 feet, and is bailing to test. Thomason and others are arranging for a drill stem test of 8 feet of sand in No. 7 Muslow, Section 31-21-15, total depth 2,160 feet.

Claiborne Parish

Haynesville — Smitherman & McDonald's No. 1 Miller, Section 17-23-8, is shut down waiting for core barrel, total depth 4,243 feet.

Homer—Oakes and others' No. 1 Richardson, Section 19-21-7, is shut down at 700 feet, corrected depth.

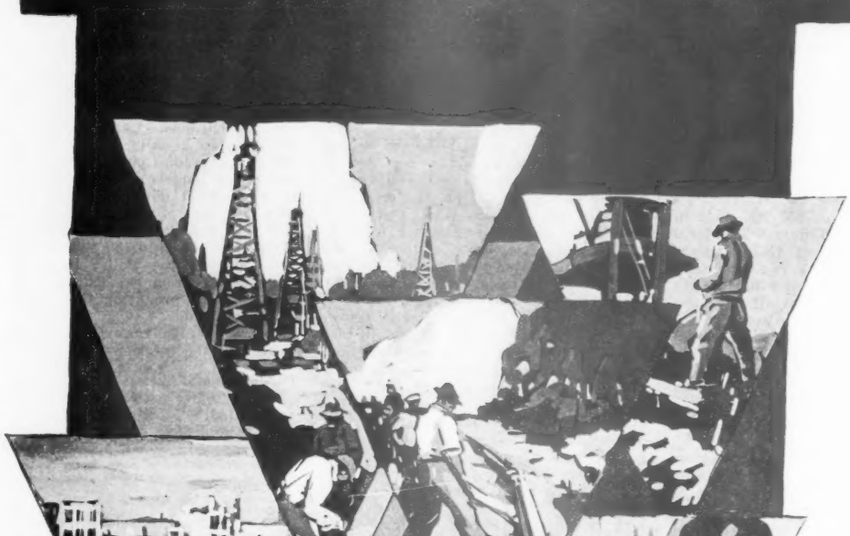
LaSalle Parish

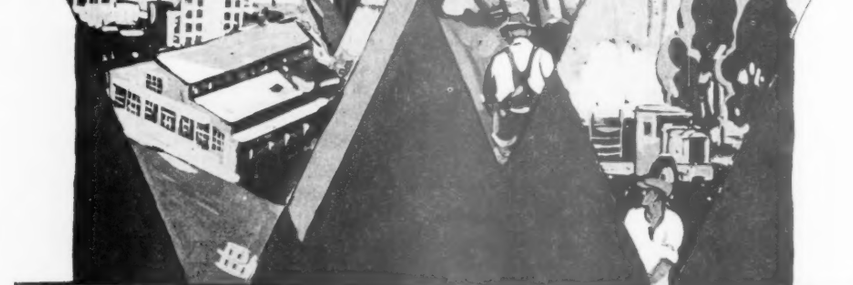
Urania — Ayers Brothers are coring No. 6 Tremont, Section 30-10-2e, at 1,-550 feet. H. L. Hunt's No. 5 Urania, C NE SW, Section 2-9-1e, set 100 feet of 10-inch and is drilling at 900 feet.

Little Creek — Montagu Oil Co. has

(Continued on Page 120)

FROM WELL TO METER





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New Mexico Tests Center of Attention

Interest in Colorado in Recent Discovery Near Pueblo. New Tests in Lincoln and Uinta Counties, Wyoming

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Jan. 19.—The Texas Production Co. is preparing to complete its No. 1 Cagle, Section 9-26-37, in the southeastern corner of Lea County, New Mexico, as a gas well at 3,478 feet, and the Skelly Oil Co.'s No. 1 Joyner, in the same area, which is showing for a producer, was deepened 12 feet to 3,299 feet and sulphur water broke in, the latest reports showing 10 bbls. of water per day. Cranfill & Reynolds will drill another test in the Jal district, 6 miles north of the well the firm recently abandoned. A test is to be drilled in Catron County by Fenner & Bailey near a well drilled for water two years ago which showed very light oil at a shallow depth. New rules governing first year's rentals and royalties on state land in southeastern New Mexico have been issued by the state land commissioner.

The Continental Oil Co.'s test on the Boundary Butte structure in southeastern Utah had a show of several million feet of dry gas in the Pennsylvanian at 4,525 feet, and the Utah Southern and Utah Oil Refining companies have entered into an agreement for the completion of their Salt Valley test.

Interest in Colorado continued to center in the recent discovery near Pueblo which has attracted many oil company scouts. Several wells are scheduled to be drilled at once. Tests of the oil show 33.8 gravity with 34 per cent gasoline content. The Continental had one completion, a 50-bbl. well, in the Florence-Canon City district.

Wyoming had no completions for the week and wildcatting continues to be curtailed for the winter. Two new tests in Lincoln County and one in Uinta County were announced.

New Mexico

The Skelly Oil Co.'s No. 1 Joyner, NE cor. SE, Section 26-25-36, in Lea County, southeastern New Mexico, continued to hold interest this week. At a total depth of 3,287 feet, it was reported having made 100 bbls. of oil on January 8 and on the following day it made 140 bbls. Previously it had made four heads in three days, putting about 240 bbls. of oil into the tank. A little water was showing in the hole, this being placed at 3 bbls. in 24 hours. The water increased slightly until it was estimated that it stood 1,400 feet in the hole. It was then drilled deeper to 3,299 feet where at last reports it was making 10 bbls. of sulphur water per day. While under agitation from drilling this well was reported to have flowed better than 400 bbls. of oil in one day.

The Texas Production Co.'s No. 1 Cagle, SW NE SW, Section 9-26-37, in the Jal area, is shut down at 3,478 feet to be completed as a gas well. At 3,283 feet it was making 74,000,000 feet a day with a rock pressure of 450 pounds. The well is located 2½ miles north and a little west of the company's No. 1 Rhoades, the discovery well in the Jal district, and approximately the same distance northeast of the Marland's No. 1 Eaves in the SW NE, Section 19-26-37. The Eaves well, which was reported a completion last week at a total depth of 2,944 feet, gauged 42,000,000 feet of gas with a rock pressure of 1,300 pounds. The Cagle well is on a block in which the Amerada corporation and the Columbian Carbon Co. each purchased a one-third interest from The Texas Company. The gas will be held in reserve for the gas line to El Paso to be constructed by the El Paso Natural Gas Co.

Going Ahead

Cranfill & Reynolds are reported to have decided to go ahead with their No. 1 Wilson, NW SW NE, Section 23-35-36, for which a location was made last July, but which was temporarily abandoned. Present plans are to commence spudding on February 1. The location is 6 miles north and half a mile east of its No. 1 State, SE NE, Section 23-26-36, which was abandoned last month at 3,500 feet. Marland Production Co.'s No. 1 Lynn, NW cor. SE, Section 26-23-36, which had another flow of gas estimated at 25,000,000 feet at 3,540 feet, is core drilling at 3,575 feet. Same company's No. 1 Meyer, SW cor. NW, Section 26-20-37, which had around 4,000,000 feet of sulphur gas at 3,505 feet, is tied up with a fishing job at 3,538 feet, and its No. 1 Reed, NE cor. SW, Section 22-20s-36, is drilling at 2,350 feet in salt. It topped the salt at 1,645 feet. The Marland's No. 1 Lockhart, NW NW, Section 31-21-36, in the Eunice district, is drilling at 2,650 feet in salt, and its No. 1 Warren, SW SW, Section 28-20-38, in the Nadine district, is shut down at 2,930 feet after cementing the 8¼-inch at that depth. The Marland's No. 1 Brooks, NW cor. SW, Section 8-20-33, is drilling below 3,840 feet in gray lime. The Texas Production Co.'s No. 1 Shepherd, SE cor. NE, Section 6-26-37, which was bottomed at 3,180 feet and moving boiler back at last report, had an estimated flow of 4,000,000 feet of gas at 3,160 feet. After drilling a few feet deeper another estimate placed the quantity at 15,000,000 feet. Same company's No. 1 Moberly, NW SE, Section 17-26-37, is core drilling below 3,250 feet. The Texas Pacific Coal & Oil Co.'s No. 1 State, SE cor. SW, Section 22-23-36, is drilling sand at 175 feet, and A. D. Morton's No. 1, C NW, Section 29-11-38, in the northern end of the county, is shut down at 1,180 feet. The Midwest Refining Co.'s No. 13 Farnsworth, NE NE, Section 13-26-36, in the Jal district, is drilling at 670 feet in red shale with a hole full of water at 520 feet, and its No. 19 Farnsworth, SW SW, Section 12-26-37, is drilling out cement after cementing off bit. Total depth is 3,877 feet. Henderson, Dexter & Blair's No. 1 McDonald & Jewett, SE cor. Section 18-20-34, is shut down at 620 feet in red shale, and the Gypsy Oil Co.'s No. 1 Mattern, SW cor. SE, Section 24-21-36, is rigged and ready to commence spudding. The Empire Gas & Fuel Co.'s No. 1-C State, SW cor. Section 12-21-34, is bottomed at 3,310 feet and fishing for tools, and Hill & Abel's No. 1 Maechtel, SW cor. Section 5-26-33, is drilling at 4,600 feet in gray and brown lime. The Maljamar Oil & Gas Co.'s No. 2 Pearsall, NE NE, Section 33-17-32, is drilling at 3,767 feet in lime.

Eddy County

In Eddy County, Flynn, Welch & Yates' No. 1 Jackson, C NE, Section 13-17-30, northeast of the Artesia Pool, is drilling at 3,355 feet, and George F. Getty, Inc.'s No. 1 Bates & Martin, C SE SW, Section 31-20-29, in the Twin Mounds Pool, is fishing at 342 feet. In the Artesia Pool, Leonard & Levers' No. 1 Haggerty, NE cor. NW, Section 18-16-30, is drilling by tools at 2,170 feet, and Flynn, Welch & Yates' No. 56 State, Section 6-19-28, is drilling at 2,180 feet.

In Catron County, Fenner & Bailey are moving in a rig for their No. 1-S, NW SW, Section 35-2n-16w. This is close to a well drilled on the Britton ranch for water in the SW cor. Section 3-1n-16 in 1927 which topped a water sand at 250 feet and which at 350 feet had a show of 40 gravity light oil followed by more water at 450 feet.

In McKinley County, H. L. Williams' No. 2 Pettit, SW cor. SE, Section 30-18-8, on the Hospah Dome, is reported abandoned at 1,800 feet, and the Inland Oil Co.'s No. 1 Goodnight, NW cor. Section 22-18-10, in the Seven Lakes district, is reported abandoned at 1,407 feet.

In San Juan County, Fidelity Oil & Refining Co.'s No. 2 James, NW cor. Section 23-29-11, in the Bloomfield district, is reported abandoned at 55 feet after having stood for nearly a year. The Kutz Canon Oil & Gas Co.'s No. 1 Day, SW, cor. Section 20-28-10, is drilling at 620 feet and carrying the 10-inch, and the Angel Peak Oil Co.'s No. 1 Garland, NE NE, Section 11-28-11, in the same district, is fishing for parted casing at a total depth of 1,800 feet. The Iowa Oil Syndicate's No. 1 Viles, SE cor. Section 28-29-11, is plugging back from a total depth of 870 feet, where water was encountered, to show for a small pumper at 750 feet. The Dorothy Oil Co.'s No. 1 Goede, SE SE, Section 29-30-9, in the Blanco district, which was plugged back to 4,243 feet from a total depth of 4,582 feet, was reported this week to have 500 feet of oil in the hole. Some oil had previously shown in this sand in the top of the Mesa Verde and the well was being conditioned to run the gas through a small absorption plant erected near the well. This company has purchased the plant which has been supplying the town of Aztec with natural gas. The same company's No. 2 Goede, NW SE, Section 29-30-9, is underreaming at 540 feet.

Carlsbad, in the Pecos Valley in southeastern New Mexico, was served with

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CYPRESS HILLS WELL BLOWS IN; STEAM USED TO CUT ICE BARRIER

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Jan. 19.—In the Cypress Hills Field, southern Alberta, Eagle Butte Oil Co.'s No. 1 discovery well, LSD 3, Section 31-7-4w4, is under control and is reported on definite measurement to show a production of 20,000,000 feet a day. Before getting the well under control, the crew had to cut their way with steam through an ice barrier formed after the well blew into production. Large quantities of sand were blown from the well and piled high outside the derrick, but the interior of the rig was found clear, and the control head attached to the 8¼-inch casing. The well is spraying some water, apparently from a horizon above the gas sand, and efforts will be made to shut off this water. The test will be carried deeper for oil, but if none is encountered efforts will be made to market the gas, possibly to the cities of southern Saskatchewan, which have already been approached for franchises. The main gas production was met in the Dakota sand at 3,340 feet, the initial open flow being estimated as high as 40,000,000 feet a day. The location is some 32 miles from Medicine Hat, and the test proves a structure mapped some two years ago by Dr. W. S. Dyer of the Geological Survey of Canada. Roth & Faurot, of Independence, Kans., are interested in the Eagle Butte Oil Co.

In the Skiff Field, southern Alberta, Imperial-Devenish's No. 3 test is rapidly nearing completion. At last reports it was at 1,808 feet and drilling, with expectations of reaching the producing sand, around 3,090 feet, early in February. The rotary outfit made 1,738 feet in 20 days' actual drilling, which is claimed to be a new record for southern Alberta.

In Milk River district, Capitol Oil & Gas Co.'s No. 1, LSD 4, Section 4-2-12w4, is reported fishing around 700 feet, but is planning to drill through the winter. Commonwealth Petroleums' No. 1, LSD 9, Section 9-3-15w4, is getting ready to resume drilling after cementing the 20-inch string at 413 feet.

West of Coutts, D. McTaggart has hauled derrick timbers for Ko-Top Oils' No. 1, in SE, Section 2-1-17w4, on the Red Coulee structure. It is reported that Alberta Pacific Consolidated, Ltd., of Calgary is organizing a subsidiary company to drill a test in the Red Coulee area in the spring; and a third company has secured some acreage in the same field.

Further estimates of Alberta crude oil production place the total value of the 1928 output at $1,923,198, the total including $1,588,629 for Turner Valley crude naphtha, $313,812 for Turner Valley light crudes, and $20,757 for Wainwright heavy crudes. Government figures when available may show a production in excess of the generally accepted estimate of 485,318 bbls.

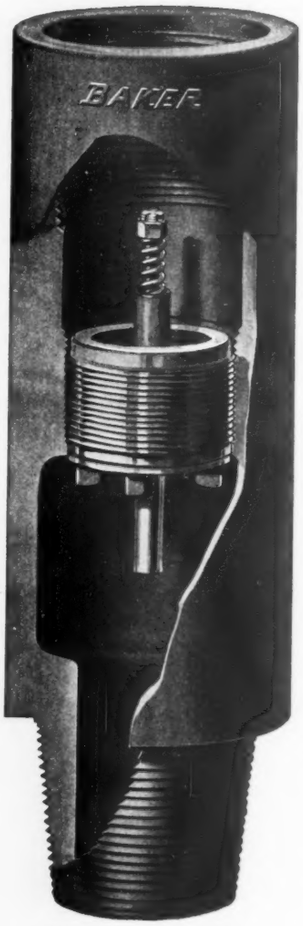
Ice-encrusted rig of the Eagle Butte Oil Co.'s 20,000,000-foot gasser in the new Cypress Hills Field, southeastern Alberta.

Turner Valley

In the Turner Valley Field, Royalite Oil Co.'s No. 14, LSD 4, Section 7-20-2w5, has made some new hole after sidetracking the lost lubricator, and has now finished cementing the 4½-inch casing at 3,252 feet. This is 32 feet in the deep lime, which was encountered at the record high point of 3,220 feet. As soon as the cement sets the well will be drilled into production. Home Oil Co.'s No. 1, LSD 10, Section 20-19-2w5, is drilling again in the deep lime at 5,155 feet, after some delay fishing for lost drill

(Continued on Page 117)

Was That Last String of Drill Pipe That Parted So Crooked You Had to Sidetrack?



View of the complete assembly ready for insertion between the tool joints.

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There are no plugged strings and wet jobs with the Baker Drill Pipe Float Valve, because the valve is constructed with ample passageway and does not in any way restrict the flow of the circulating fluid.

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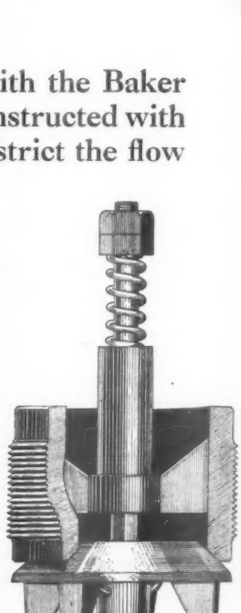

On the right is a cutaway view of the new improved Baker patented Valve Assembly. A deeper cross member gives more strength—yet the passageway for the circulation was increased a little. The valve stem is now nickel chromium steel and a lock nut on the upper end. It is without a doubt the best Drill Pipe Float Valve on the market today.

Send for circular which has a table giving the distances from the top of the hole at which the Drill Pipe Float may be safely used.

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Santa Fe Springs Trend Still Upward

Deep Zone Development Continuing at Rapid Pace. Production of Elwood Field Increased. Producers Holding Up Well

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Jan. 19.—Daily production at Santa Fe Springs, reflecting the completion of numerous new deep zone wells, showed a substantial increase during the past week and continued the major up trend which started during the middle of November. Deep zone development in this field is continuing at a rapid pace and will result in the completion of a large number of new wells, especially during the next few weeks. The most important completion listed at Santa Fe Springs was the General Petroleum's No. 225 Santa Fe, which blew in doing 8,960 bbls. of clean 34.3 gravity oil daily from the Buckbee zone at 5,805 feet. The importance of this new well lies in its geographical location and the exceptionally large initial daily output. This is the largest deep zone well finished in the Santa Fe Springs Field and it is unusually important because it proves up the eastern end of the field as capable of yielding exceptionally large wells. It must be remembered that No. 225 Santa Fe is located directly on the axis of the Santa Fe Springs structure and would therefore naturally result in substantial production. The eastern end is showing up much better than the area west of the apex where several drilling projects have failed to encounter production, notwithstanding drilling operations have progressed in one instance to 6,875 feet. The development of substantial production in the eastern part is especially significant in view of the development at Sunshine Acres, a subdivision of the old Meyer property, a part of which was relinquished by the Union Oil Co. after the initial boom had ceased a few years ago. The Sunshine Acres tract, which has been subdivided into 1-acre parcels, will probably not prove a very important factor in daily production, although there is evidence that a portion may be found productive. It is logical to assume, however, that most of this acreage will be edge production.

New Completions

The General Petroleum, which has been rather slow in completing new wells in the deep zone due to enforced idleness because of the Bell View's recent gas fire and George F. Getty's No. 17 Nordstrum, which ran wild for 48 consecutive days, stepped out during the past 10 days and finished nine new wells with an aggregate initial daily production of 36,758 bbls. The General Petroleum suffered another suspension this week when George F. Getty's No. 20 blew out and took fire. The gas originated in the 2,000-foot dry gas horizon, known to exist for several years and which resulted in the loss of several wells during the early stages of development. The General Petroleum's No. 145-C Santa Fe was blowing out simultaneously with the eruption in Getty's No. 20 and drilling operations in the immediate vicinity were suspended. In addition to No. 225 Santa Fe, the General Petroleum finished eight other wells. No. 227 Santa Fe and No. 161-A were finished in the deep Buckbee zone a few days ago and both registered satisfactory production. The former tanked 4,283 bbls. of 34.9 gravity oil during the initial 24-hour test from 5,679 feet, while the latter started off doing 3,865 bbls. of 34.8 gravity oil daily from 5,753 feet. No. 160-A Santa Fe and No. 186-E Santa Fe Community were both finished in the intermediate Nordstrum zone early in the current week. No. 160-A is flowing 2,605 bbls. daily from 5,015 feet, while the latter is making 2,790 bbls. from 5,185 feet.

On the Hill-Midway lease, the General Petroleum recently completed No. 103 flowing 5,320 bbls. daily from 5,740 feet, the hole having been finished with a 5¾-inch oil string. This well was followed into production by No. 101 E. G. B., which tanked 3,500 bbls. daily from the Nordstrum zone at 5,282 feet, and No. 190-C Santa Fe doing 2,125 bbls. per day from the Buckbee zone at 5,728 feet. No. 191-C Santa Fe Community was completed doing 3,350 bbls. from the deep Buckbee zone at 5,748 feet. The General Petroleum, the largest single operator in the field, still has a large number of potential producers nearing completion in both the Nordstrum and Buckbee horizons. The Standard and Union also have several immediate potential producers in the deep zone and both are expected to list satisfactory completions within a few days. The former chalked up two new wells, both being finished in the deep Buckbee horizon. No. 7 Koontz, finished early in the week, came in doing 1,190 bbls. of clean 35.3 gravity oil and 970,000 feet of wet gas daily from 5,819 feet, while No. 12 Walker, finished a few days ago, tanked 4,160 bbls. during the initial 24-hour production test from 5,757 feet. Graham & Loftus, who have experienced considerable success in deep zone development at Long Beach, brought in No. 2 Santa Fe in the Nordstrum zone early in the past week flowing 2,750 bbls. daily from 5,285 feet, the hole having been finished with an 8¼-inch landed at 5,220 feet.

Elwood

Production of the prolific Elwood Field of Santa Barbara County was increased to 18,000 bbls. when the Barnsdall and Rio Grande's No. 2 Doty came in under a natural flow doing 4,000 bbls. of exceptionally clean 38.1 gravity oil and 1,300,000 feet of saturated gas daily, and field production will be further increased within two weeks as a result of the completion of No. 5 Bell, at present standing cemented on top of the pay. The new well just completed was carried down to 3,490 feet and finished with a 6¼-inch oil string carrying 192 feet of 100-mesh screen. No. 2 Doty came in with considerable kick, the pressure being 265 pounds on the tubing and 1,060 pounds on the casing and is capable of producing in excess of 6,000 bbls. per day if opened up. It has been beaned down to approximately 3,500 bbls. daily to take advantage of the maximum safety factor and should, like its predecessors, show consistent sustained production. The drilling equipment used on No. 2 Doty has been moved to No. 3 Doty and this project will be spudded in shortly.

Five producers have been completed in the Elwood Field since its discovery and all have been holding up exceptionally well. The oil is now being moved out by tankers instead of by tank car, as during the early stages. Additional storage facilities are being provided by the erection of two new 118,000-bbl. steel tanks and the Rio Grande has found it necessary to double the capacity of its Elwood absorption plant. Natural gasoline production is averaging in excess of 12,000 gallons per day and this figure is expected to be substantially increased as a result of the completion of new wells. There was no change in the status of any of the various outposts being drilled within a radius of 5 miles from the Barnsdall's discovery well at Elwood as neither the Cady Oil Co., Ted Martin, J. E. O'Donnell, the Petroleum Securities nor any others have picked up more than a few minor colors so far as the Vaqueros is concerned. Some of these outposts may develop production in the Sespe formation which underlies the productive Vaqueros at Elwood.

The Barnsdall and Rio Grande hope to secure production in the Sespe formation within the productive limits of the Elwood Field when developments warrant a deep test.

Kettleman Hills

Drilling operations in the Kettleman Hills Field of Kings County are getting under way very quickly and at least 10 wells are expected to be making hole within a few weeks. Five of them, comprising George F. Getty's No. 1 Armstrong in Section 4-22-17, No. 1 Beal and No. 2 Elliott of the Milham Exploration Co. and Nos. 8 and 81 of the Standard, are under way. The Milham Exploration Co.'s discovery, No. 1 Elliott, is holding up in splendid shape, a recent gauge indicating a daily production of 4,191 bbls. of clean 60.6 gravity oil and 31,000,000 feet of wet gas. George Getty's initial test on the Armstrong property is about 2 miles west of the Milham's discovery and, while this would ordinarily be considered a long way from production, it is not so far removed as the Kettleman Hills Field is expected to be California's largest district in areal extent. The water and fuel oil problem, which has always caused considerable inconvenience in this section, has been taken care of by piping in water a distance of about 15 miles and by the installation of electric power lines. The Standard's No. 81 in Section 11-22-17 was the first well to be spudded in at Kettleman Hills with electrical energy. George F. Getty is also utilizing electric power in the drilling of his No. 1 Armstrong, a recent spud. Both electrical energy and steam will be utilized in the

(Continued on Page 123)

IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well, location—	S-T-R	Depth	Status—
California Western Oil Co., No. 1 Elkins, Ventura Co.	28- 4-19	2,951	suspended
Exline, Emma, No. 1 Saticoy, Ventura Co.	33- 3-21	2,412	fishing
Ohio Oil Co., No. 1 Saticoy, Ventura Co.	32- 3-21	4,806	fishing
Standard, No. 5-9 Saticoy, Ventura Co.	10- 2-22	4,370	hd. sd. drilling
American Oil Co., No. 1 Camarillo, Ventura Co.	33- 2-20	660	hd. sd. drilling
Star Pet. Co., No. 2 Canet, Ventura Co.	13- 3-23	6,775	resume work
Bolsa Chica, No. 1 Temescal, Ventura Co.	4- 4-18	653	sd. drilling
Miley, E. J., No. 2 Casitas, Ventura Co.	12- 3-21	785	suspended
Shell, No. 1 Marr, Simi	31- 3-17	1,202	hd. sd. drilling
Continental, No. 1 Sulphur Mountain, Ventura Co.	21- 4-22	3,365	br. sh. drilling
Continental, No. 2 Sulphur Mountain, Ventura Co.	22- 4-22	3,870	br. sh. drilling
Milham Expltn., No. 1-A Buttonwillow, Kern Co.	8-28-23	4,662	gas well
Milham Expltn., No. 2 Buttonwillow, Kern Co.	8-28-23	2,730	gas well
Milham Expltn., No. 3 Buttonwillow, Kern Co.	8-28-23	2,694	gas well
Milham Expltn., No. 4 Buttonwillow, Kern Co.	6-28-23	2,670	gas well
Milham Expltn., No. 5 Buttonwillow, Kern Co.	5-28-23	2,500	gas well
Milham Expltn., No. 6 Buttonwillow, Kern Co.	8-28-23	2,676	gas well
Milham Expltn., No. 7 Buttonwillow, Kern Co.	6-28-23	2,720	suspended
Milham Expltn., No. 8 Buttonwillow, Kern Co.	16-28-23	4,500	suspended
Doheny-Stone, No. 1 Salisbury, Kern Co.	7-29-24	4,631	cleaning out
South. Calif. Gas Co., No. 1 Buttonwillow, Kern Co.	4-28-23	4,272	suspended
South. Calif. Gas Co., No. 2 Buttonwillow, Kern Co.	27-28-23	rig	suspended
Lincoln Drlg. Co., No. 1 Buttonwillow, Kern Co.	6-28-23	901	sd. sh. drilling
Richfield Oil Co., No. 1 Semitropic, Kern Co.	21-26-22	4,760	set pipe
Richfield Oil Co., No. 2 Semitropic, Kern Co.	36-27-23	....	location
Pacific Eastern, No. 1 Union Ave., Kern Co.	6-30-28	5,840	suspended
Pacific Eastern, No. 2 Union Ave., Kern Co.	6-30-23	4,500	suspended
Pacific Eastern, No. 3 Union Ave., Kern Co.	6-30-28	4,443	gas shut in
Pacific Eastern, No. 5 Union Ave., Kern Co.	5-30-28	4,991	suspended
Stabler, W. W., No. 1 Commanche Point, Kern Co.	23-32-29	3,130	suspended
Symark Oil Co., No. 1 Edison, Kern Co.	24-29-29	815	gr. sd. drilling
Midway Northern, No. 1 Edison, Kern Co.	29-29-30	3,841	suspended
Deizel, S. A., No. 1 Delano, Kern Co.	4-26-27	3,193	good showing
Elmer Oil Co., No. 1 Shafter, Kern Co.	8-28-25	5,504	fishing
Standard, No. 1 San Emidio, Kern Co.	35-11-22	3,793	fishing
Union, No. 1 San Emidio, Kern Co.	5-10-21	1,614	fishing
Perry, C. V., No. 1 McFarland, Kern Co.	34-26-26	1,900	bl. sh. drilling
Currency Pet. Co., No. 1 Vineyard, Fresno Co.	28-21-14	950	bl. sh. drilling
Thomas Pet. Co., well No. 1, Fresno Co.	33-22-16	....	location
Union, No. 1 Huasna, San Luis Obispo Co.	34-32-15	3,232	redrilling
Union, No. 1 North Huasna, San Luis Obispo Co.	12-32-14	2,880	reaming
Panorama Oil Co., well No. 1, San Luis Obispo Co.	7-31-21	3,360	br. sh. drilling
Dollar Oil Co., well No. 1, San Luis Obispo Co.	13-32-22	rig	suspended
Sequoia Oil Co., well No. 2, San Mateo Co.	15- 7- 5	1,605	suspended
Sunset Pacific, No. 1 Saratoga, San Mateo Co.	13- 7- 4	rig	suspended
Calhoma Oil Co., No. 1 Livermore, Alameda Co.	9- 3- 3	1,505	hd. sd. drilling
Foster & Hammill, well No. 1, Alameda Co.	21- 3- 3	448	hd. sd. drilling
R. Y. Hanlyn, well No. 1, Alameda Co.	3- 5- 2	360	suspended
Shell, No. 1 Guadalupe, Santa Barbara Co.	36-10-35	1,950	hd. sd. drilling
Shell, No. 2 Goleta, Santa Barbara Co.	36- 5-31	rig	rigging up
Standard, No. 1 Point Conception, Santa Barbara Co.	.....	rig	rigging up
Standard, No. 1 Point Arguello, Santa Barbara Co.	X- 7-35	808	gr. sd. drilling
Bankline Oil Co., No. 1 Mesa, Santa Barbara Co.	X- 4-27	....	location
Tepesquit Oil Co., well No. 1, Santa Barbara Co.	3- 9-32	2,710	suspended
Becker, Geo. F., No. 1 Summerland, Santa Barbara Co.	33- 4-25	3,090	suspended
Channel Oil Co., well No. 1, Santa Barbara Co.	29- 4-27	6,304	cleaning out
Continental, No. 1 Carpenteria, Santa Barbara Co.	33- 4-25	3,440	sd. sh. drilling
Southwest Prod. Co., No. 1 Gillam, Santa Barbara Co.	2- 4-28	2,207	rd. sd. drilling
Colusa Oil Co., well No. 1, Colusa Co.	31-15- 4	380	redrilling
Nuna Oil Co., well No. 1, Colusa Co.	19-15- 5	400	suspended
Superior Oil Co., No. 1 Calivada, Colusa Co.	31-15- 4	1,011	suspended
North Counties Oil Co., well No. 2, Humboldt Co.	36- 2- 1	2,205	suspended
Humboldt Oil Co., well No. 1, Humboldt Co.	6- 2- 1	3,041	redrilling
Kuhns, H. L., well No. 1, Merced Co.	9-12- 9	1,570	hd. sd. drilling
Angiola Oil Co., No. 1 Angiola, Tulare Co.	27-22-23	2,911	hd. sd. drilling
Shell, No. 1 Dudley, Monterey Co.	15-22- 9	....	location

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Hurst Oil Co., No. 1 Inglewood, Los Angeles Co.	28- 2-14	122	suspended
Mont. Park Oil Co., No. 1 Browning, Monterey Park	26- 1-12	4,420	suspended
Mont. Park Pet. Co., No. 1 Jepson, Monterey Park	25- 1-12	3,937	suspended
Dollar Oil Co., No. 1 Bell, Los Angeles Co.	22- 3-12	4,470	gr. sd. drilling
Associated, No. 1 Taylor, Los Angeles Co.	33- 2-12	5,894	sd. sh. drilling
Rio Grande, No. 1 Los Angeles Co.	34- 2-12	1,265	hd. sd. drilling
Continental Oil Co., No. 1 La Mirada, Los Angeles Co.	10- 3-11	5,913	abandoning
Shell, No. 2 Mission, San Fernando	4- 2-15	5,692	abandoned
Security Pet. Co., No. 1 Lynwood, Los Angeles Co.	13- 3-13	5,333	suspended
Richfield, No. 1 Maywood, Los Angeles Co.	13- 2-13	3,320	sd. sh. drilling
Easton & Smith, No. 1 Calabasas, Los Angeles Co.	19- 1-17	2,982	suspended
Russell Oil Co., No. 2 Joughin, Los Angeles Co.	25- 3-17	1,500	br. sh. drilling
Pomona Oil Co., well No. 1, Los Angeles Co.	32- 1- 8	1,081	suspended
Anchor Oil Co., No. 1 Puente, Los Angeles Co.	19- 2-10	4,820	suspended
Richfield Oil Co., No. 1 Puente, Los Angeles Co.	9- 2-10	3,434	to test showing
Calif. Eastern, No. 1 Wickham, Los Angeles Co.	32- 5-17	2,860	450,000 ft. gas
The Texas Company, No. 1 Anaheim, Orange Co.	35- 4-10	3,360	hd. sd. drilling
Bastanchury Ranch Co., well No. 1, Orange Co.	21- 3-10	rig	suspended
Mesa Pet. Co., No. 1 Newport, Orange Co.	21- 6-10	3,482	suspended
West Drlg. & Prod. Co., No. 1 Newport, Orange Co.	18- 6-10	4,425	fishing
West Drlg. & Prod. Co., No. 2 Newport, Orange Co.	18- 6-10	....	location
Hall Pet. Co., No. 1 Murrieta, Riverside Co.	23- 7- 3	931	fishing
Hemet Pet. Co., No. 1 Ward, Riverside Co.	9- 5- 1	3,071	suspended
Davenport O. & G. Co., No. 1 San Marcos, San Diego Co.	30-12- 8	892	suspended
Turner, S. S., No. 1 Escondido, San Diego Co.	25-12- 2	1,600	hd. sd. drilling

Midland County, Mich., Getting Play

Pure Oil Co. Has Four Wells Promising Long Life. Drilling Is Deeper Than in the Muskegon Field

By Special Correspondent

MUSKEGON, Mich., Jan. 19.—Michigan's most important new development is now taking place near the city of Mount Pleasant in Greendale Township, Midland County, and Chippewa Township, Isabella County.

In this new field opened by the Pure Oil Co. shortly after the discovery of commercial production in the Muskegon area only four wells have been completed partly due to the fact that the Pure Oil Co. owned most of the leases before drilling was started and partly to the greater depth of the first pay sands.

Prospects at Mount Pleasant, however, are that a good field with long-lived wells will be developed. It costs between $25,000 and $40,000 to drill there to the Dundee formation in which the first pay sands are encountered. The depth is about 3,550 feet and none of the four present producers has made more than 300 bbls. initially.

That the wells have good staying qualities has been demonstrated by the discovery well, which came in a year ago the coming spring with an initial flow of about 250 bbls., is still making about 100 bbls. a day. The four wells are now producing an aggregate of about 450 bbls. a day.

Of course operators are looking for and expecting to find greater initial production. Development of the field is bound to be much slower than in the Muskegon Field because a comparatively few oil companies have leases.

Five new wells are drilling in the vicinity of the producers, two are rigging up and operations will be started on three announced locations as soon as the weather permits. In addition to these the Pure Oil Co. has two rigs standing on the railroad siding at Mount Pleasant which also will be moved to new locations as soon as possible.

In Two Townships

The present development in the Mount Pleasant Field is confined to two townships, one in Isabella and the other in Midland Counties. Production also has been found so far only in the Dundee formation at about 3,550 feet. The oil produced at this depth is of a much higher gravity than that encountered in the same formation in the Muskegon Field.

Of the four producing wells, three are in Greendale Township, Midland County, and one is in Chippewa Township, Isabella County. They are all within a short distance and development has centered closely about the producing wells.

All of the three producers in Greendale Township were drilled for the Pure Oil Co. No. 1 Root, NE SE, Section 18-14n-2w, the discovery well, is still producing about 100 bbls. a day. No. 1 Lilly, SE NE, Section 18-14n-2w, a north offset to No. 1 Root, is now making about 30 bbls. a day. No. 1 Raynor, SW SE, Section 18-14n-2w, is making 170 bbls. a day.

The Chippewa Oil Co., a South Bend syndicate, has completed the only producing well in Chippewa Township, Isabella County, which adjoins Greendale Township, Midland County, on the west. It is known as the No. 1 Jocelyn, SE SW, Section 12-14n-3w. The top of the Dundee formation was encountered at 3,518 feet and the top of the pay was at 3,551 feet. It was drilled 8 feet into the pay sands and is now producing about 150 bbls. of oil a day.

The nearest of the five drilling wells to production is F. W. Stork, trustee's No. 1 Coon, SE cor. E half NE, Section 12-14n-3w, Chippewa Township, Isabella County. It is drilling at about 3,300 feet after setting 3,135 feet of 6⅝-inch 24-pound seamless casing.

The Pure Oil Co. has three wells drilling, all of which are in Greendale Township, Midland County: No. 1 Sias, NW NE, Section 17-14n-2w; No. 1 Shirts, NW SW, Section 17-14n-2w; and No. 1 Reems, NE cor. SE SW, Section 18-14n-2w.

No. 1 Sias is drilling at 1,250 feet after having had serious trouble in getting started and having skidded the rig twice. It was started in May, 1928. Mr. Talbot also is drilling No. 1 Shirts which has reached 430 feet. No. 1 Reems is drilling at 1,140 feet. It is a west offset to No. 1 Raynor producer.

The Consumers Power Co., a Michigan utility, is drilling its first well on a 40-acre lease NE NE, Section 20-14n-2w, Greendale Township, Midland County, and it is drilling in the northeast corner of the lease at 600 feet.

Two wells are rigging. One is for a Rockford, Ill., syndicate, in the SE cor. E half SW, Section 11-14n-3w, Chippewa Township, Isabella County. The other is No. 2 Jocelyn, SE SW, Section 12-14n-3w, Chippewa Township, Isabella County.

There are three locations in Chippewa Township.

The Sias Oil & Gas Co., of Midland, will drill No. 1 McClintic, NW SW, Section 1-14n-3w, as soon as weather permits.

The Leonard Oil & Gas Co., of Washington, Pa., has a rig on location for its No. 1 in SE NE, Section 11-14n-3w.

The Athens Oil Co., of Athens, Ohio, has a location for its No. 1 Bufford, S half NW, Section 14-14n-3w. Operations will be started by April 1.

The Pure Oil Co. has two rigs on the railroad siding at Mount Pleasant which will be moved to locations in Section 20-14n-2w, Greendale Township, Midland County.

Muskegon Field

Extensive prospecting campaigns of the entire lower peninsula of the State of Michigan, involving the expenditure of more than $5,000,000 in the drilling of tests, the work to be started as soon as there is a break in the weather. These plans are being held in abeyance pending the passage of new Michigan oil and gas operation, taxation and public utility laws.

The Pure Oil Co., the Dixie Oil Co., subsidiary of the Standard Oil Co. of Indiana, the Sun Oil Co., the Ohio Oil Co., the Muskegon Oil Corp., Norris and Smith and other independent interests are included among those who have plans for extensive structure test drilling and deep test drilling throughout the lower half of Michigan.

The Pure Oil Co. now has more than 1,000,000 acres under lease and proposes to continue its deep drilling program in the Mount Pleasant Field as well as to develop other wildcat properties with structure test drilling.

The Dixie Oil Co. is reported to have contracted to drill on parts of 250,000 acres owned by the Consumers Power Co. at a cost of more than $2,000,000. The Consumers company is reserving all of the natural gas rights as it is now operating artificial gas plants in a number of leading cities.

The Muskegon Oil Corp., the Dixie Oil Co. and the Grayling Development Co. have started a test drilling program on 161,000 acres owned by the Hanson Lumber Co. in Roscommon County. A contract for the drilling of 10 structure tests has been let and the first is under way.

The Grayling Development Co. spent $80,000 drilling two deep tests in the north and south portions of Roscommon County during the past two years. Both have been plugged. It now proposes to seek a possible oil pool on a scientific basis in conjunction with the Muskegon Oil Corp. and its four associated companies and with the aid of the geological department of the Dixie Oil Co.

Frank L. Maire, president of the Lima Oil Corp., formed to operate on his many leases in Michigan, is planning to consolidate his interests into one company which will test large blocks in other counties than Muskegon where he has been confining his operations until the recent drilling of a wildcat in Newaygo County, about 20 miles northeast.

Norris and Smith, of Grand Rapids, have plans for developing about 500,000 acres under lease in various sections of the State.

Muskegon Completions

As a result of the severe weather, there have been but four completions in the Muskegon Field, three in Muskegon Township and one in Laketon Township. All have struck either oil or gas or both. Three have been completed in the Dundee formation at about 2,050 feet and one is a small producer in the upper Traverse pay sands at 1,638 to 1,650 feet. E. L. Robinson's No. 3 Flentje, SE NE, Section 9-10-16, which came in as a 35-bbl. initial producer.

The largest new producer was L. E. Kennedy's No. 1 Giles, NE SE, Section 6-10-16, which filled a 500-bbl. tank in 18 hours and was estimated good for 675 bbls. initially. It extended the field one-quarter of a mile north and west of the Swastika Oil & Gas Co.'s No. 1 Giles gasser, SE SE, Section 6-10-16.

The Bowers Oil Co.'s No. 2 Seiner, SW SE, Section 5-10-16, was the third successful completion in Muskegon Township coming in with an open flow of gas gauged at 5,500,000 feet a day from the Dundee pay sands at 2,043 to 2,051 feet.

The Royal Petroleum Co.'s No. 1 Launstein, SE SE, Section 1-10-17, Laketon Township, proved a disappointment in the Dundee formation when it was drilled into the bottom salt water at 2,070 feet. Oil and about 500,000 feet a day of gas had been struck at 2,066 to 2,068 feet and the well started to flow at the rate of about 150 bbls. a day by heads. It was drilled 2 feet deeper, however, and struck water. A bottom plug will be used in an attempt to shut off the water and pump the well. If successful it should make about 100 bbls. a day.

Discovery of water in this well at a depth of only 4 feet into the pay indicates it is on the north edge in Laketon Township. Four dry holes in Sections 1 and 2 of Laketon Township north and northwest tend to support this statement. Of four wells drilled in Section 1-10-17, the Launstein well is the only one in which there has been any signs of oil or gas in the lower formation. The others had signs but not commercial production of oil and gas in the Traverse formation.

Flow of the Concord Oil & Gas Co.'s No. 1 Lewis, SW NW, Section 7-10-16, was increased from 150 bbls. to more than 700 bbls. a day by deeper drilling to 2,031 feet.

The same company's No. 1 Giles, NE NW, Section 7-10-16, is showing about 2 per cent water and has to be steamed. It is the first of the large producers in that part of the field where the larger new wells have been brought in during the past three weeks to show any water. It is not enough to harm the well and is not known to be bottom water.

Another of the two Dixie Oil Co.'s wells on the property of James Dow, NW SE, Section 5-10-16, was drilled into the gas and had a daily flow of 2,500,000 feet when drilling was stopped at 2,058 feet. The well will be drilled into the oil pay sands next week. This was No. 1-D Dow. No. 2-D Dow, which had drilled into a flow of 3,500,000 feet of gas a day at 2,054 feet, has not yet been drilled into the oil pay sands on account of the weather. A string of 5⅞-inch casing has been run, shutting off the gas.

The Wolfe Oil Co.'s No. 1 Sloan Brothers, SW SW, Section 14-10-1[illegible] Muskegon Township, the first of the new wells started in the vicinity of two Continental Motors Corp. producers, was dry in the upper Traverse formation and will be drilled to the Dundee. It was cased at 1,670 feet and drilled to 1,8[illegible] feet.

One of the two Continental producers struck the pay sands at 1,709 feet and made 250 bbls. initially, and the other came in as a 30-bbl. well at 1,728 feet. The Continental company is now drilling two more wells, one southwest and the other northwest of these producers.

The Lima Oil Corp.'s No. 3 Haight, SE NE, Section 9-10-16, is drilling into the upper Traverse pay after setting casing at 1,603 feet.

The Lilyseu company's No. 1 Trieweiler, NW NW, Section 5-10-16, which had a show of oil in the lower Traverse pay sands at 1,920 feet, was shot to a depth of 1,928 feet but failed to make a commercial producer so it will be drilled to the Dundee formation.

There are in Muskegon Township other than the wells already mentioned 9 wells shut down, 3 fishing for tools, 5 drilling between the Traverse and Dundee, 7 drilling above the Traverse formation, 7 spudding, 10 moving in or rigging, and 29 announced locations on which there has been no activity.

There are five new locations in Muskegon Township: Bowers & Lentz, Inc., No. 1 Hallock, NW NW, Section 7-10-16; Natural Gas & Oil Co.'s No. 1 Giles, NE NW, Section 7-10-16; Natural Gas & Oil Co.'s No. 2 Giles, NE NW, Section 7-10-16; Globe Oil Co.'s No. 1 Lanstra, NW NE, Section 7-10-16; and J. V. Howard's No. 1 Ellen Van Bruss, SE NE, Section 15-10-16. The first four are in the newly productive area and the fifth is spudding on a 10-acre tract near the Continental Motors Corp. producers in Section 15-10-16.

Laketon Township

The Laketon Township area provided a surprise when the Paragon Oil Co.'s No. 1 Sebolt, SE NE, Section 12-10-17, struck a flow of about 1,000,000 feet a day of gas in the lower Traverse pay sands at 1,940 feet. It was drilled into the salt water at 1,970 feet and will be carried to the Dundee. This is the first well in which any considerable show of gas has been encountered in the lower Traverse pay.

There are five new locations: Concord Oil & Gas Co.'s No. 1 Beegle, NW NE Section 12-10-17; V. M. Voorhees and others' No. 1 E. Varner, SW SW Section 15-10-17; Reed Oil Co.'s No. 1 Young, SE NE Section 11-10-17; Pure Oil Co.'s No. 1 A. Young, SE NE Section 12-10-17, and Ottawa Oil Corp. and Crude Oil Co.'s No. 1 William DeLong, NE SE Section 12-10-17.

Rigs are moving in for the first four and a rig will be moved next week. All but one are in the proven territory.

Muskegon County Wildcats

One Muskegon County wildcat was dry in the upper Traverse formation last week when salt water was struck at 1,700 feet, another had cased above the Dundee and was ready to be drilled into the lower formation; a third has started to run casing at about 2,100 feet and a fourth was shut down within a short distance of the casing point above the Dundee.

The White River Oil Corp.'s No. 1

(Continued on Page 124)

West Virginia Leads in Completed Wells

Most Are Gassers, and None Above Average. Ravenswood District, Jackson County, Having a Good Deal of Test Work

By D. S. Wakenight
Staff Correspondent, Eastern Fields

PITTSBURGH, Pa., Jan. 21. — The week of development work in the eastern fields proved unsatisfactory. There were few completions and no large producers. The deep sand territory in southeast Ohio completed only a few wells better than the average size. What is most needed in southeast Ohio is the discovery of another pool like that in Harrison Township, Perry County. As a town lot development it was a hummer, but did not hold up, owing to the pool having been drilled closely.

During the week, the West Virginia Fields completed the greatest number of wells. Aside from a good gasser, none came in better than light pumpers. The increasing amount of new work starting is the leading feature. The cold weather is causing some delay but with the return of spring West Virginia will be the most active in the eastern fields. All hope for the discovery of a new pool has not been abandoned. There are still large areas that have not been fully tested.

The discovery of a new pool in Buffalo Township, Butler County, Pennsylvania, was the surprise of last year and its area has not yet been defined. Very few, if any, operators expected Butler County to come to the front with a new pool after more than 60 years of intensive development work and only goes to show that a new pool can be discovered in a locality long regarded as barren.

Southeast Ohio

In the NE of Section 20, Harrison Township, Perry County, the Pure Oil Co. completed and shot in the Clinton sand a second test on the Katherine Moore farm. It produced 30 bbls. the first 24 hours. In Section 8, same township, Miller, Jewell & Co. completed in the same formation a test on the Israel Henning farm. It produced 25 bbls. the first 24 hours.

In the SE of Section 8, Harrison Township, Perry County, Miller, Jewell and others have completed a test on the Israel Henning farm. It produced 25 bbls. the first 24 hours after shot in the Clinton sand.

In the SW of Section 31, Clayton Township, Perry County, the Dun Mar Oil & Gas Co. completed a test on the James Higgins farm. It is a light gasser in the Clinton sand.

In the NW of Section 37, Hinckley Township, Cuyahoga County, the Preston Oil Co. has completed in the Clinton sand a test on the H. H. Wesebaum farm. It is a 5-bbl. pumper. In Sutton Township, Meigs County, O. D. Sloan has started to drill another test on the J. E. Stobert farm.

In Section 9, Jefferson Township, Noble County, L. A. Patten has a 3-bbl. pumper at No. 5 on the Theodore F. Davis farm. In the same section and township, Myra S. Lee has the same kind of a pumper on the H. Maginnis farm.

In the NE of Section 23, Island Creek Township, Jefferson County, the Boyer Drilling Co.'s No. 4 on the Catherine E. Wilt farm is a light pumper in the Berea grit.

Washington and Meigs Counties

On Bear Run, Section 9, Lawrence Township, Washington County, William Lee, Sr., has completed No. 10 on the William Lee, Jr., farm. It is a 10-bbl. pumper in the salt sand. In Section 17, Sutton Township, Meigs County, O. D. Sloan and others have a duster at a second test on the John E. Stobert farm. In Section 31, Chester Township, the City Trust & Savings Bank has a 5-bbl. pumper at No. 4 on the Wesley Genheimer farm.

West Virginia

The best the West Virginia fields had to offer was a fair gasser. On Twelve Pole Creek, Harvey district, Mingo County, F. H. Yates drilled a test on the M. C. Burchett farm into the Maxon sand. At a total depth of 965 feet gas was struck and the flow estimated at 6,250,000 feet. Nearly all of the wells in this district get gas above the oil and when the gas subsides they are drilled deeper to the oil-producing sand. It is quite possible Mingo County will have more operations during the current year than at any time in the past.

In Jackson County, Ravenwood district, there is quite a good deal of test work under way and starting. The prospects for new production look rather favorable. The oil is found in the Berea grit, one of the most reliable producing formations in West Virginia. The best well completed up to this time is the South Penn Oil Co.'s 40-bbl. producer on the McCarty farm.

Harrison County

On Ten Mile Creek, Ten Mile district, Harrison County, William Moses and J. M. Raad have completed through the Gordon sand No. 7 on the John Shahan farm. It is a fair gasser in the formation named. On Skelton Run, McClellan district, Doddridge County, the same parties have the rig completed for a test on the M. T. Lyons farm.

In Clay district, Ritchie County, H. H. Chogville & Co. have completed in the Maxon sand No. 5 on the J. L. McCullough farm. It is dry and abandoned. On Hughes River, same district, the Hope Natural Gas Co. has a gasser in the Big Injun sand on the M. K. Doty farm. One mile east of Smithville, on Leather Bark Creek, Murphy district, A. R. Kelley and others completed a test on the J. M. Reymer farm. It is dry in the Squaw sand and all upper formations.

On Big Hocking Run, Spencer district, Roane County, the Federal Oil & Gas Co. has completed and shot in the Salt sand No. 42 on the Pell, Roberts and Newman tract. It is producing 20 bbls. a day. In Troy district, Gilmer County, the Valley Oil & Gas Co.'s test on the Enos Miller farm is dry in the Gantz sand, at a total depth of 2,450 feet.

In Lee district, Calhoun County, the Calhoun Oil & Gas Co. has a 4-bbl. pumper in the Big Injun sand at a test on the W. T. Anderson farm. In Union district, Harrison County, the Reserve Gas Co. has completed a test on the C. J. Bartlett farm. It is a gasser in the Speechly sand.

Lincoln County

In Carroll district, Lincoln County, the Empire State Oil & Gas Co. has a Big Injun sand gasser at No. 9 on the Mollie Courts farm. In Jefferson district, the United Fuel Gas Co. has a gasser in the same formation at No. 21 on the Horse Creek tract. In the same district, Earl Cameron has a gasser in the Big Injun sand at No. 3 on the Golden Stone farm.

In Union district, Ritchie County, Ira Cox has completed No. 5 on the Ira Cox farm. It is dry in the Big Injun sand and has been abandoned. In Clay district, the Imperial Oil Co. has drilled its test on the H. R. Jones farm through the Squaw sand. It is a light pumper.

In Troy district, Gilmer County, C. M. Bennett & Co.'s test on the E. and B. Miller farm is dry in the Gantz sand. It has been abandoned. In Grant district, Ritchie County, the Reno Oil Co. drilled down to the Big Injun sand No. 10 on the J. L. Mullenax farm. It is dry. In Murphy district, the Southern Oil Co. drilled down to and through the Big Injun sand on the Alex Dunlvey farm. It is a gasser. In Murphy district, the Hope Natural Gas Co.'s test on the M. E. Duty farm is a gasser in the Big Injun sand.

In Grant district, Cabell County, the Harshbarger Oil & Gas Co. has a gasser in the Gordon sand at a test on the Bess Howes farm. In Sherman district, Calhoun County, the Hope company has a rig completed on the Emma Johnson farm.

In DeKalb district, Gilmer County, McCall & Co. have drilled deeper No. 5 on the Riddle Brothers farm. It is a light pumper in the Big Injun sand. In Troy district, A. L. Britton has a gasser in the same formation on the A. S. Jones farm.

Ritchie County

On McFarlan Creek, Murphy district, Ritchie County, Franklin Deem and others have drilled a test on the Alva Ayers farm into the Maxon sand showing for a 3-bbl. pumper. In the same district, the Mellon Oil Co.'s No. 4 on the Charles G. Lewis farm is a gasser in the Berea grit. In Murphy district, J. F. Deem & Co. have a 3-bbl. pumper in the Maxon sand at a second test on the A. H. Ayers heirs' farm. In the same district, the Southern Oil Co. has drilled deeper No. 1 on the Alexander Dunlevy farm. It is a gasser in the Big Injun sand. In Troy district, Gilmer County, A. L. Britton's test on the A. S. Jones farm is a gasser in the same formation.

Calhoun County

In Lee district, Calhoun County, the United Carbon Co. has completed in the Big Injun sand a second test on the A. H. and J. J. Davis farm. It is a gasser in the Big Injun sand. In the same district, the Calhoun Oil & Gas Co. has a 4-bbl. pumper in the same formation. In the same district, the Dunbar Oil & Gas Co. has a Maxon sand gasser at a test on the I. G. Flesher farm.

In Chapmanville district, Logan County, the Trojan Gas Co. has a gasser in the Salt sand on the Henry McKinney farm. In Southwest district, Doddridge County, the Pittsburgh & West Virginia Gas Co. has completed a test on the W. T. Snyder farm. It is a gasser in the Big Injun sand.

In Union district, Wood County, the Oil City Trust Co. has drilled No. 6 on the Hebrank-Rapp farm into the second Cow Run sand and it is a 3-bbl. pumper.

Wetzel County

In Grant district, Wetzel County, the Carnegie Natural Gas Co.'s test on the Lee Clover farm is a gasser in the Big Injun sand. In Clay district, the Villers Oil & Gas Co. has a Gordon sand gasser on the Harvey Villers farm. In the same district, the Carnegie Natural Gas Co. has drilled a deeper test on the Eliza Marshall farm. It is a 2-bbl. pumper in the Gordon sand.

In Liberty district, Marshall County, the Manufacturers Light & Heat Co. has drilled deeper a test on the Hicks-Pipes farm. It is a gasser in the Gor-

(Continued on Page 112)

TEN COMPLETIONS WITH 280 BBLS. IN KENTUCKY-TENNESSEE FIELDS

By Whit
Staff Correspondent, Kentucky-Tennessee

OWENSBORO, Ky., Jan. 21. — The eastern half of Kentucky failed to report a single completion and there were very few from the western portion. No wells of production out of normal were reported anywhere in the Tri-County Field of Daviess, Ohio and Hancock Counties. A tremendous flow of gas was struck in a stray sand on the Mrs. Sallie Thomas farm, on the south side of Rough River just above the town of Dundee. The gas belched forth without warning and immediately caught fire. The driller, Grider Howell, was severely burned about the head and face and the drilling rig was badly damaged.

Almost every well in the Dundee section and for miles around has produced gas and several weeks ago the Louisville Gas & Electric Co. leased some farms between Dundee and Narrows and started cleaning out a gas well discovered by Porter Evans several months previously, but due to the discovery of gas on other leases of the company the rig was moved away. This gas has a sulphur smell and will possibly be treated before being used. It is certain that when drilling in that area of the county great caution must be used at the depth in which this shallow gas is usually found.

Pipe Line Runs

The runs of the Illinois Pipe Line Co. from the western Kentucky fields for December amounted to 197,924.27 bbls.

In the eastern part of the western Kentucky division, the Paragon Development Co. ran from Clinton, Cumberland and Monroe Counties, for December, 3,381.37 bbls., and from Barren County, known as the Glasgow Field, 17,982.85 bbls., and from the Clay County, Tennessee, fields 442.23 bbls. This company for the year 1928 ran through its lines from the counties mentioned in which it handles oil in Kentucky, totaled 326,627.24 bbls., and for the same period handled from Tennessee fields a total of 32,762.52 bbls.

The runs of the Stoll Oil Refining Co., from Barren County, for December amounted to close around 9,000 bbls.

The Producers Pipe Line Co., headed by James C. Ellis, has handled considerable crude from Ohio and Daviess Counties.

Completes Telephone System

The Illinois Pipe Line Co. completed laying its submarine cable across the Ohio River and bringing its individual telephone lines direct from Findlay, Ohio, its general headquarters, into the Owensboro and Bowling Green offices, in Kentucky. All of the company's stations will be connected to the telephone system and reports will be made direct to the Findlay office of operations in western Kentucky.

Week's Work

A summary for the week from the Kentucky fields shows 10 completions, 7 producers with an initial production of 280 bbls., 3 dry holes and no gas wells.

County—	Comp.	Oil wells	Prod.	Dry
Daviess	5	4	185	1
Ohio	4	3	95	1
Allen	1	0	0	1
Total	10	7	280	3

Daviess County Wells

The best of the late completions in the Owensboro Field of Daviess County is the Creek Drilling Co.'s No. 3 on the Jeff Leet 66 acres, in the Utica area,

(Continued on Page 112)

NEW!

BUILT TO STAND THE LOAD AND THE SPEED !

Two additional casing or sand line sheaves are mounted at right angles to the 5 sheaves in the center pin. On top of this is bolted a structure built up of two 8″ H beams and two 15″ I beams and channels. On top of this is bolted the Crown Block shown on opposite page. The casing line sheaves can be left in the derrick for standard drilling or placed in the pumping derrick.

"Oilwell" 7-Sheave Center Pin Type Crown Block

910

OIL WELLS

WORLD'S OLDEST AND LARGEST MANUFACTURERS OF OIL FIELD EQUIPMENT

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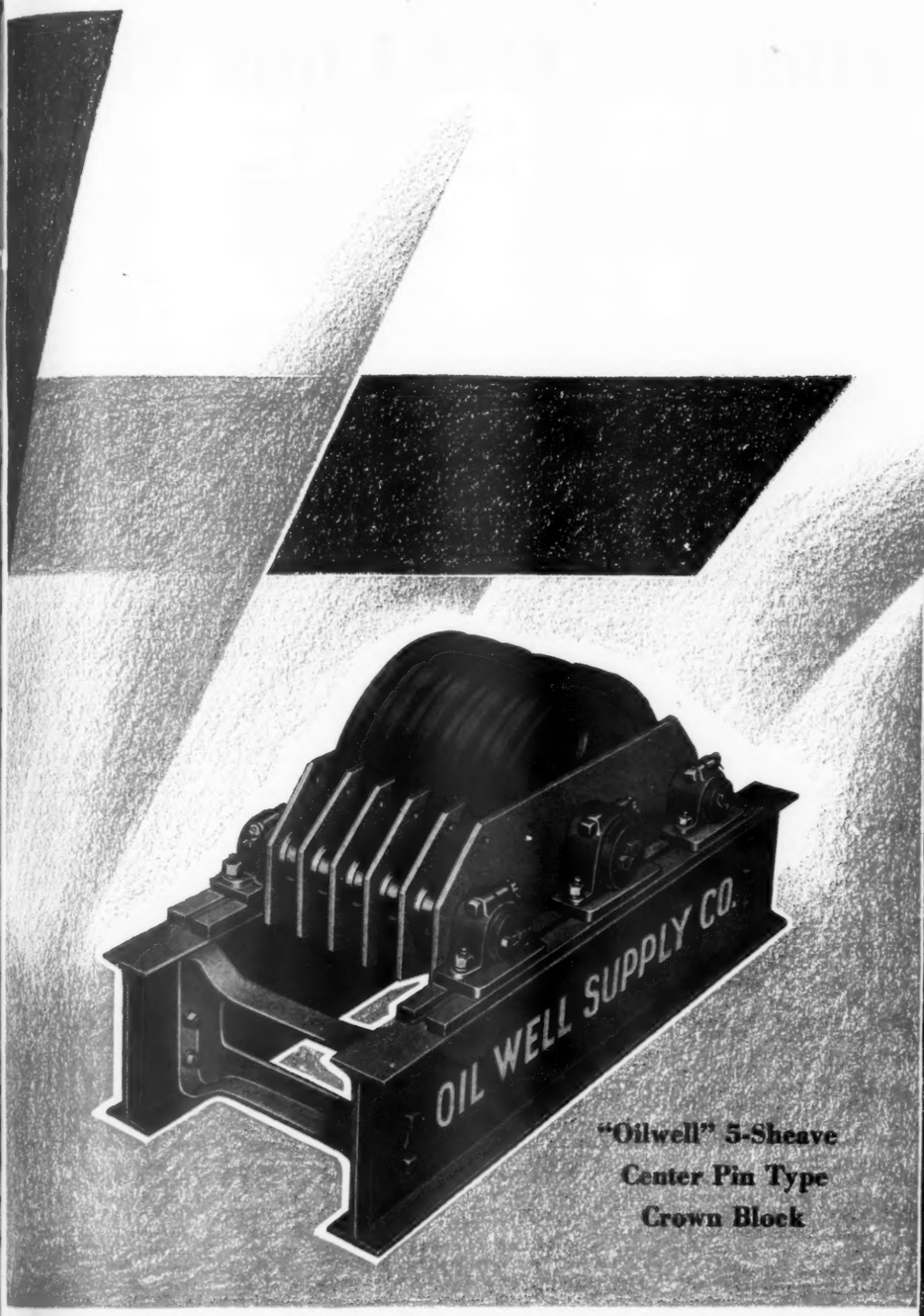

"Oilwell" 5-Sheave
Center Pin Type
Crown Block

BUILT TO STAND THE LOAD AND THE SPEED !

Each bearing of the "Oilwell" Crown Block is lubricated through an individual channel in the pin, insuring proper lubrication. Roller Bearings in the sheaves operate in sleeves and casings, preventing wear on stationary pin. Manganese steel sheaves with rope grooves ground to A.P.I. standards prevent excessive wear of the line. The whole unit is adjustable lengthwise on the beams by means of patented "Oilwell" slides. Perfect alignment of Crown Block, Travelling Block, Hook and Swivel is thus made possible under all operating conditions.

SUPPLY CO.

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BRANCH STORES
IN ALL OIL FIELDS

Four Completions in Old Lima Field

Central Ohio Maintaining Its Development Pace. Illinois Makes Better Showing in Number of Completions Than for Some Time

By Whit

Staff Correspondent, Central West Fields

FINDLAY, Ohio, Jan. 21.—Four completions are reported from the old Lima Field of northwestern Ohio, three of which are in the Murphy Pool or its vicinity in Liberty Township, Seneca County, known as the Tiffin Field. In this pool, W. E. Richards and others' second test in the northwest corner of the Lawrence Sherger farm, on the oil map as the G. F. Michaels farm, in the southwest quarter of Section 27, which topped the Trenton at 1,338 feet and drilled 174 feet in that formation to a total depth of 1,512 feet, produced an initial of 40 bbls. Muncy Valley Oil & Gas Co.'s No. 1 well, 600 feet from the south line and 50 feet from the east line of the S. Shrodes farm, mapped as the W. Hartman farm, in the northwest quarter of Section 28, got the top of the Trenton at 1,325 feet and drilled 117 feet in the formation to a total depth of 1,442 feet, producing but 1 bbl. the first 24 hours. P. F. O'Brien and others' test near the northeast corner of the Milo Saul farm, in the northeast quarter, Section 36, failed to make an oil producer but is reported good for a gas volume of 1,000,000 feet, at a total depth of 1,491 feet, or 74 feet in the Trenton. This was the most active area of the old Lima Field for the past seven months and some excellent wells were uncovered along with a lot of dry holes. The pool has been more productive close around the discovery well on the Hunker farm and spread a little in all directions from the first producer, but practically no extensions of any great distance have been made from the pool with the exception of just a little south of east where a couple of fair producers were found.

East of Findlay, in Biglick Township, Hancock County, and near the Wyandot County line, Robert Mitchell, trustee, drilled a second well in the southwest corner of the Alva Beard farm, on the oil map as the D. and R. Moore farm, in the SW NE, Section 16, which had an initial production of 20 bbls. from a depth of 1,322 feet, or in the sand 109 feet. R. W. Kirk and others are still reported working on the test on the Henrietta Hays farm, Section 34, same township.

Central Ohio

Central Ohio Field is starting in the new year with about as much development work as at any period during the last half of 1928 and this work will no doubt continue if weather conditions will permit. The past week's developments show 25 completions, 6 of which were oil-producing wells with an initial production of 241 bbls., 7 dry holes and 12 gas wells. The best gas well of the week was found on the George W. Shaw farm, Section 13, Muskingum Township, Muskingum County, being the Ohio Fuel Gas Co.'s No. 3-3,347 on the farm named, while the best oil producer was the Heisey Gas Co.'s second test on the S. L. Burrier farm, Section 5, Hopewell Township, same county, with an initial production of 85 bbls. in a sand from 3,130 to 3,160 feet, while the gas well found its big volume at from 3,414 to 3,456 feet. In Perry Township, same county, the Ohio Fuel Gas Co. is drilling No. 1-3,400 on the Edward P. Allen, Section 15, close to where the Mid-East Oil Co. recently found a nice oil well in a test on the William Knight farm, in the same section. In Washington Township, same county, the Bateman Oil Co. is drilling a test on the Mary A. Bateman heirs, Section 7.

In Ashland County, the Ohio Fuel Gas Co.'s No. 1-2,029 on the R. E. Brown, Section 16, Hanover Township, has been cleaned out and makes a light gas well. In Green Township, same company has a very nice gas volume in No. 1-3,309 on the Frank E. Milligan farm, Section 32, in 8 feet of Clinton lime formation. The Logan Gas Co. abandoned its location for No. 1-3,067 on the Ira Richards farm, Section 14, Orange Township, and the Kemrow Co. is starting No. 3 on the Emma Miller, Section 11, same township. Same company is starting a test on the Maurice Topping farm, Section 12, Montgomery Township, same county.

In Medina County, Montville Township, the Ohio Fuel Gas Co. found a broken sand in No. 1-3,349 on the L. O. Quayle, Lot 83, and it is a dry hole. In Lorain County, the Ohio Fuel Gas Co. is drilling No. 1-3,332 on the John Coghlin, Lot 23, Carlysle Township.

Two new wells have started drilling in Wayne County, both by the Ohio Fuel Gas Co., No. 1-3,353 on the Elize Somerside farm, Section 6, Congress Township, and No. 1-3,047 on the Alice C. Bowman, Section 32, Chester Township. In Paint Township, Holmes County, the Logan Gas Co. made a location on the Henry Fritz, Section 33.

In Knox County, Howard Township, Harry Perkins' test on the James Griffith farm, Section 13, was dry at a depth of from 2,690 to 2,714 feet. In Brown Township, the Ohio Fuel Gas Co. is starting No. 3-3,401 on the A. J. De Long farm, Section 9.

In Coshocton County, Pike Township, the Leonard Oil & Gas Co.'s No. 3 on the Isaac Norris, Section 12, produced 75 bbls. of oil and about 100,000 feet of gas from 3,170 to 3,225 feet. William Stevens is drilling on the J. and E. Lake farm, same section. In Crawford Township, the Ohio Fuel Gas Co. is starting the drill at No. 1-3,356 on the William Dickesheet farm, Section 7. The Logan Gas Co. made a location for No. 1-3,070 on the Victor Shiebe farm. Section 1, Clark Township, same county.

Summitt County

In Summitt County, Franklin Township, F. A. Brendall and others brought in an excellent volume of gas at a test on the E. A. Raber farm, Section 26. East Ohio Gas Co. is drilling on the George Helmslater farm, Section 27.

In Licking County, Fallsburg Township, the Preston Oil Co.'s second test on the Wayland Ashcraft farm, Section 11, produced an initial of 2 bbls. from a shallow sand at from 728 to 739 feet. Emerald Petroleum Co.'s test on the Jacob Weise farm, Section 8, is reported dry at from 638 to 646 feet. Same company is drilling a second test on the John E. Martin farm 10 acres, Section 10. Hulse & Kundtz are drilling a second test on the G. W. Moran farm, Section 11. In Perry Township, the Whitehill Gas Co.'s No. 3 on the Albert Ashcraft farm, Section 2, produced an initial of 70 bbls. from 2,880 to 3,930 feet along with close to 90,000 feet of gas. H. C. Farmer's No. 3 on the Emmett Hoover farm, Section 3, pumped close to 3 bbls. initially at from 681 to 691 feet.

In Athens County, the Ohio Fuel Gas Co.'s No. 2-3,375 on the John T. Fleming farm, Section 3, Ames Township, developed a nice gas volume in the second Berea sand from 1,430 to 1,450 feet and went to a total depth of 1,455 feet. Same company's No. 1-3,364 on the G. O. Linscott farm, Section 5, is an average gas well in the same formation at from 1,354 to 1,369 feet and total depth, 1,375 feet. Orondoff and others' test on the Vesta Thompson farm, Section 3, is a fair gas well in the second Berea sand at from 1,319 to 1,340 feet; total depth, 1,355 feet. In the first Berea sand from 1,275 to 1,300 feet no showing of oil or gas was encountered. Ohio Fuel Gas Co. is starting the drill at No. 5-3,338 on the J. E. Gifford farm, Section 2, same township. In Dover Township, the same company's No. 1-3,299 on the Ohio Colliers Co. property, Section 24, is a dry hole. Sand in this well from 3,801 to 3,831 feet was dry and drilled to a total depth of 3,902 feet. In Athens Township, the Athens State Oil & Gas Co., or Gross and others, have a dry hole at a second venture on the C. M. Higgins farm, Section 19, in the first Berea sand at from 1,240 to 1,255 feet. In Berne Township, McBride and others' test on the L. W. Wright farm, Section 24, found the first Berea sand from close around 1,434 feet, with only slight showing and encountered the lower Berea at from 1,444 to 1,458 feet, total depth 1,464 feet, and was only an average light gas producer. In the same township, the Ohio Fuel Gas Co.'s No. 1-3,345 on the Lewis J. Elliott farm, Section 36, developed a nice producer of gas in the lower Berea sand at from 1,358 to 1,379 feet, total depth 1,388 feet. Same company's No. 10-3,339 on the Black Diamond Coal land, Section 23, is an average gas producer in the Salt sand at from 943 to 956 feet. In York Township, Hultz & Kundtz's second test on the D. F. Shafer farm, Section 9, was a duster.

In Meigs County, Chester Township, Frick and Barnaby's No. 4 on the Wesley Genheimer farm, Section 21, pumped an initial of 6 bbls. from the upper Berea sand at from 1,857 to 1,870 feet. In Sutton Township, the Preston Oil Co. made a location for No. 5-1,284 on the C. J. and W. R. Easterday farm, Section 18. Tyree and others are drilling No. 4 James Stobart farm, Section 17, and No. 2 on the Martin Eversback farm, Section 13.

Jackson County

In Jackson County, Milton Township, the Ohio Fuel Gas Co. made a location for No. 1-3,417 on the J. C. Washburn farm, Section 18, Milton Township. Same company is drilling No. 1-3,363 on the L. T. Rice farm, Section 13, Lick Township.

In Stark County, Lawrence Township, Cashdollar and others' test on the Jacob Nichter farm, Section 3, is estimated close to 1,000,000 feet of gas.

In Guernsey County, Cambridge Township, the Gordon Oil Co. is drilling deeper No. 1 on the Virgil Reed farm, Lot 9. In Wheeling Township, the Ohio Fuel Gas Co. made a location for a second test on the W. J. Alloway farm, Lot 10. The Logan Gas Co. has a fairly nice gas producer, a little above the average at No. 1-3,055 on the W. J. Alloway, same section. In this well the Niagara lime was found at 3,320 feet; pay sand at from 3,485-89 feet, total depth 3,492 feet. F. V. McLaughlin is drilling No. 3 on the Marry Pozzo farm, Section 19, Adams Township. Ohio Fuel Gas Co. made a location for No. 3-3,419 on the R. F. Dennis farm, Lot 16, Jackson Township.

In Morgan County, Marion Township, the Ohio Fuel Gas Co. is drilling No. 5-3,246 on the Hiram Thomas farm, Section 17. Bowman Oil & Gas Co. is drilling No. 4 C. L. and S. Spurrier farm, Section 26. In Penn Township, Bauman and others' No. 30 on the John P. and C. E. Hilaman farm, Section 14, made an excellent gas showing in the Salt sand at from 700 to 705 feet. Sutton Brothers have an average gas well at No. 12 on the Jesse and Mary Williams farm, Section 15, and in the lower Berea sand at from 1,388-1,405 feet; total depth 1,456 feet. Ohio Fuel Gas Co. has a light gas well in No. 1-3,365 on the Shirley Janes farm, Section 3, same township.

Noble County

An interesting communication from an old-time operator in Noble County, Ohio, says: "What is considered one of the best strikes in petroleum in Noble County came as the result of operations of recent date in what is known as the Alice Mallett farm, in Jefferson Township. The pay was found in the Germantown 800-foot and the Maxon sands. The first two wells in these formations started off at 10 and 12 bbls. The third well in the Maxon sand is making 8 bbls. natural and bids fair to show a much greater production. No dry holes have been drilled, as five sands have proved productive, and if the pay is missed in one sand it has been found in another. Three rigs are running and other wells will be started within a short time. The territory comprising this block of some 700 acres has never been tested, and it is thought an entire new pool has been located. Operations now cover approximately one-half of the territory under lease. The pay is found at a depth of 900 to 1,250 feet, costing from $1,500 to $1,800 to complete and equip a well, which makes the proposition interesting compared with the Zanesville district and others located in that part of Ohio. The territory lease is owned by Caldwell and Zanesville parties, sponsored by J. H. Yerian and Homer Cain of Caldwell.

Indiana Oil News

A review of development work in the Indiana fields compiled by T. M. Kingsbury, state gas supervisor, Department of Conservation, Division of Geology, Indianapolis, Ind., follows:

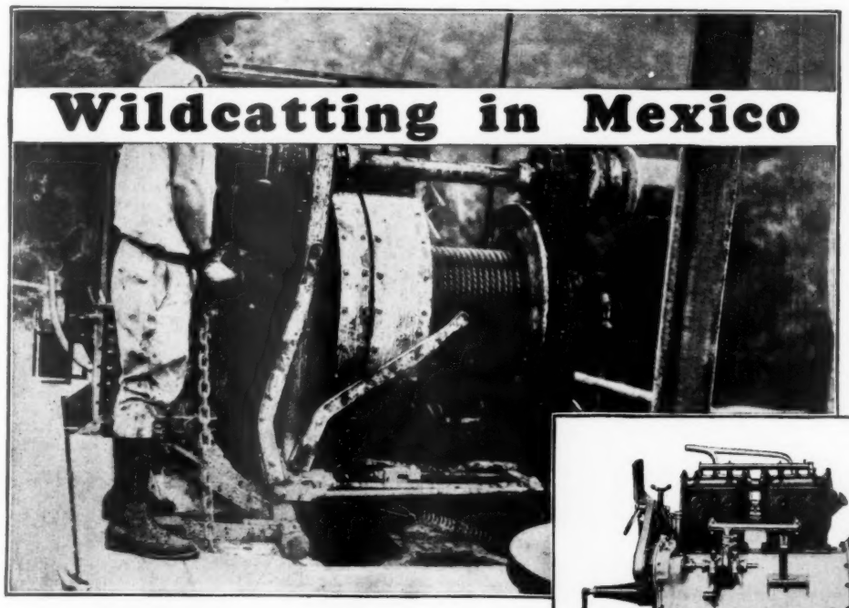
Adams County—D. D. and H. O. Jones started drilling about the middle of the month on the John Clauser farm, Section 28, Blue Creek Township, which adjoins the S. C. Tinkham farm on which a well was drilled several weeks ago.

Gibson County—Bell Brothers brought in a 30-bbl. well in No. 5 on the Frank Thompson farm, Section 6, Washington Township, at 1,585 feet. Their well on E. and S. Ewing farm, same township, made 10 bbls., sand being found at 1,795 to 1,800 feet. Their well on the Rudolph Nixon farm, Section 1, same township, was dry. No reports have been received on the progress of the two wells being drilled in Section 18, one on the C. T. Sloan farm by the Big Four Oil Co., and one on the Paul White farm by Mann & Huber. The Washington Oil Snydicate has started No. 2 in this township on the Laura Dillon farm, Section 18. In Barton Township the Gem Oil Corp. brought in a shallow gas well at 287 feet which is making from 6,000 to 8,000 feet, on the Mary E. Duncan farm, Section 8, just west of its Yeager well. Its No. 2 on the Susan M. Farries farm, Section 5, produced 35 bbls. on head at 1,336-50 feet and will settle in 30 days to a 30-bbl. well. This is an offset to the J. B. Williams well, same section, drilled by Randall & Rogers and which made an initial production of 40 bbls. In Columbia Township the Roxana Petroleum Corp. got a dry well on the R. Hollen farm, Section 22, total depth being 1,525 feet. In Center Township, Joe Young abandoned his No. 3 on the F. Wilderman farm, Section 31, at 1,480 feet.

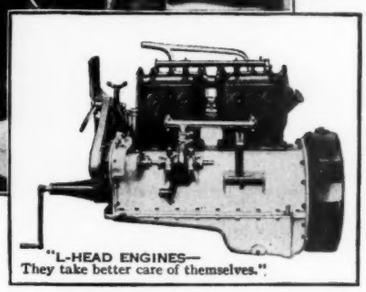
Greene County—The latest report on the B. A. Rose well, Section 3, Stockton Township, south of Linton, was that it was 1,400 feet deep and had been shut down for orders.

Jay County—Production of 20 bbls. is reported for the well on the Oscar Cur-

(Continued on Page 117)



This machine was designed for drilling 2500-ft. holes and it has more than come up to expectations.



WEIGHING less than six tons this Sheldon D Machine, powered by a Waukesha 60 hp. engine, drilled 4160 feet—set 12½-inch diameter surface pipe—2700 feet of 6⅝-inch diameter casing and drilled the last 750 feet in limestone with rock bits all within 40 days' time. And this record was made at a tremendous saving in the cost of fuel and transportation.

Waukesha oil field engines are built in sizes up to 300 hp. to meet each oil field production requirement with the size most economical. The engines are readily portable and do not require elaborate foundation or enclosing buildings for mounting or protection.

904 *OIL INDUSTRY EQUIPMENT DIVISION*

WAUKESHA MOTOR COMPANY

New York Tulsa **Waukesha, Wisconsin** Houston San Francisco

Exclusive Builders of Heavy-Duty Internal Combustion Engines for Over Twenty Years

EQUIPMENT AND SUPPLIES

BUTLER PLANS TO MAKE PLANES COMMERCIALLY

A climbing speed of 1,400 feet a minute and a high cruising speed of 135 miles an hour were recorded by the "Butler," first plane of the Butler Aircraft Corp. in its initial test flight at Fairfax Field, Kansas City, Mo., recently. Following the trial tests, in which the plane performed almost every feat known to flying, E. E. Norquist, president, announced that the company would engage in the airplane manufacturing industry immediately in an extensive way.

The three-passenger "Butler," weighing 1,650 pounds empty, is powered by a 200-horsepower Wright Whirlwind motor. It was designed by Waverly Stearman, for eight years connected with the Swallow and Laird airplane manufacturing companies. He is a brother of Lloyd Stearman, president of the Stearman Airplane Co.

The Butler Aircraft Corp. is a subsidiary of the Butler Manufacturing Co., Kansas City and Minneapolis, and the plane was built in the Butler factory in Kansas City. The company will also make metal airplane parts and accessories on a large scale for other airplane manufacturers.

NEW 5-CENT AIR MAIL STAMP STIRS COMMENT

Appearance of the new 5-cent air mail stamp has occasioned comment among purchasers.

"Whassat? A windmill?"

"Looks like an oil derrick."

Numerous queries have come to the Post Office Department.

The authorities say the design on the new stamp represents the highest airway beacon in the world. It is situated on top of Sherman Hill, 30 miles west of Cheyenne, Wyo., on the Boeing Air Transport San Francisco-to-Chicago route. The beacon stands 10,000 feet above sea level.

These airway beacons have been supplied the Government by the International Derrick & Equipment Co., and are manufactured in its plants in Columbus, Ohio, and Torrance, Calif.

In addition to airway beacon towers, Ideco is manufacturing for the aviation industry radio direction towers, landing light supports, flood-light towers, mooring masts, steel hangars and standardized steel airport buildings.

OPENS TULSA OFFICE

P. M. Raigorodsky, secretary and treasurer and chief engineer of the Engineering Research & Equipment Co., has opened an office of the company in Tulsa, from which he will serve the Oklahoma and Kansas territory. The company maintains offices in Dallas, Tex., and Los Angeles, Calif.

STEELE WITH SOUTH CHESTER

J. P. Steele, formerly with the Wagner Supply Co., has been appointed district sales manager for the South Chester Tube Co., Chester, Pa., in the Southwestern territory. Mr. Steele will have his offices at 305 Petroleum Building, Fort Worth, Tex.

BLACKOR DEMONSTRATED

At the recent Western Metal Congress in Los Angeles, Calif., the Blackor Co. showed an actual fusing scene demonstrating the application of Blackor to various oil tools. Some of the Blackor was used in a drill press for drilling through rock. Blackor is a hard facing material applied to steel over the entire abrasive surface, doing the work of both hard facing and insert materials.

FAIRCHILD BUYS MONOPLANE

The Shaffer Oil & Refining Co., whose general sales offices are in Chicago, has purchased a Fairchild cabin monoplane equipped with a Wasp motor, having a carrying capacity of six passengers in addition to the pilot. This plane was on exhibition at the International Aeronautical Exposition at Chicago, December 1 to 9.

NO COLUMNS OBSTRUCT VIEW IN THIS HANGAR

Of interest to the oil industry, now that the airplane is being so widely used, are the fireproof steel hangars marketed by the International Derrick & Equipment Co.

Built specifically for aeronautical use, Ideco hangars provide space unobstructed by columns, and they are said to be weather tight and fire and rust resisting. Built in sectional panels, alterations in

size can be made at will and the structure being easily erected and dismantled can be shifted from place to place as needed.

Two types of roofs are offered, gable or curved, in spans up to 120 feet in width. Lengths can be any multiple of 10 inches. Standardized steel construction is used. Hot dip galvanized steel frames and sash are standard. Hangars are double flashed throughout, with doors, sash, hardware and sheeting shop fitted and flashed to the panel frames.

Doors are mounted upon roller-bearing wheels with the weight of the door carried entirely upon the rails imbedded in the concrete floor. According to the manufacturers, they are smooth, easily operated, will not bind or jam and are flashed against the weather. When open, they nest together into the inside of the door opening. Doors may be plain or fitted with sash.

The Ideco hangar shown in the illustration is owned by the Queen City Airways, Watson Field, Cincinnati, and is used to house a big tri-motored ship.

TULSA WAREHOUSE FOR BYRON JACKSON UNITS

A warehouse has been established at 214 East Brady Street, Tulsa, by Byron Jackson Pump Co. for its three divisions —the Wilson Oil Tools Corp., disc bit division and pump division—according to Leonard Vaughn, newly appointed sales manager of the disc bit division. It is the plan of the Byron Jackson organization to carry in stock the various Wilson tools, disc bit products and pump parts. The office of the Wilson Oil Tools Corp. in the Atlas Life Building in Tulsa has been removed to the Brady Street warehouse.

L. C. Fay will continue as Mid-Continent manager of the pump division. Export offices have been established for the various divisions in the Graybar Building, New York. W. W. Cole, formerly general manager of the Craig Oil Tool Co., recently absorbed by the Byron Jackson interests, has been appointed export manager of the oil tool division, with headquarters in New York.

The new executive office building of Byron Jackson Pump Co. in East Slauson Street, Los Angeles, has been completed and the administrative work of the various divisions will be carried on there.

VICE PRESIDENTS ELECTED

At a meeting of the board of directors of the General Electric Co. on January 4 in New York, two commercial vice presidents were chosen, President Gerard Swope has announced. William J. Hanley, manager of the East Central district with headquarters in Cleveland, and Charles K. West, manager of the Atlantic district with headquarters in Philadelphia, were elected vice presidents in charge of the commercial activities of the company in their respective districts.

TWO NEW OFFICES OPENED

Offices have been opened in Detroit and Pittsburgh by the Merco Nordstrom Valve Co. The Pittsburgh office has been opened in the Clark Building, and the Detroit office at 2842 West Grand Boulevard. The Los Angeles offices were removed this month from the Union Bank Building to 556 South San Pedro Street in order to furnish greater facilities. The Merco Nordstrom Valve Co. now has offices in 12 of the leading cities and agencies in the principal cities.

THIS REFUELING TRUCK GOES ALONGSIDE AIRCRAFT

An item in a recent issue of Skyways gives interesting light on the future of the oil equipment industry in the approaching day of air travel. The item says:

"Kansas City is the home of one of the few factories in the world producing a specially built refueling equipment for airplanes and dirigibles. The apparatus, manufactured by the Columbian Steel Tank Co., is mounted on a truck which can be driven alongside any aircraft for refueling. It consists of a 1,500-gallon gasoline tank, a 100-gallon oil tank, a 100-gallon water tank and air-compression tank.

"Looking into the future, when aircraft would be as common as motor cars today, Columbian engineers have recognized that airplanes and dirigibles cannot be driven up to the curb pump but rather the pump must be driven up to the aircraft.

"The pumping apparatus and valves controlling the several tanks are located directly in front of the main gasoline tank and behind the drivers' cab. Power for the pumps is furnished by the truck motor."

MADE DISTRICT MANAGER

E. N. Wood, formerly assistant district manager of the Continental Supply Co. in the Louisiana-Arkansas territory, who was stationed at El Dorado, Ark., has been made district manager of the territory and moved to Shreveport, La. Mr. Wood succeeds H. C. Elder as district manager.

R. A. Brewer is now assistant district manager in this territory succeeding D. J. Dillabaugh, resigned.

VICTOR EXPANDS ITS SALES ORGANIZATION

The Victor Welding Equipment Co. (formerly the Victor Oxy-Ocetylene Equipment Co.) of San Francisco, Calif., has increased its capitalization, changed the company's name to simplify it, and enlarged its sales field. The Victor Welding Equipment Co. manufacturers a complete line of welding and cutting torches and pressure regulators. It has established 14 distributing and service points west of the Mississippi River, and the program for 1929 includes putting further distributing stations in the eastern territory.

The active manufacturing, engineering and sales management remains in the hands of those formerly in charge of these departments, with the exception of the withdrawal of Mr. and Mrs. F. W. Clifford, who have sold their interests and retired. Growth of the company necessitated enlargement of its board of directors.

BAKER OIL TOOLS, INC. IS NEW TITLE ADOPTED

A new name and an expansion program for its Coalinga plant are announced by the Baker Casing Shoe Co. of Los Angeles, Calif. Because the name "Baker Casing Shoe Co." no longer was indicative of its products and services, the firm has changed it to "Baker Oil Tools, Inc." Casing shoes are still an important item, but the firm has developed and is marketing a wide variety of special tools.

Stimulated by the recently renewed activity in the Kettleman Hills oil fields, the firm has begun an expansion program at Coalinga, which will include the erection of additions to its present plant, the installation of new equipment and increasing its facilities for field service.

The expansion program includes a complete and modern welding department. A portable arc welder mounted on a fast truck, manned by a trained crew, will be provided for field work.

TEXROPE DRIVES TO 50 H.P. NOW BEING CARRIED

On account of the increasing demand for immediate shipment of transmission machinery, the Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has enlarged its stocks of Texrope drives up to 50 horsepower. In 1927 an announcement was made that Texrope drives from 2 horsepower up to 15 horsepower were being carried in stock ready for immediate shipment. This was received so favorably that at the present time this stock of Texrope drives has been increased to include all the popular motor speeds and ratings up to 50 horsepower with a large choice of driven speeds in a range of ratios from 1:1 up to 7:1. The manufacture of Texrope drives for stock has brought on quantity production with a consequent reduction in price.

Natural Gas Developments

Resolutions Adopted By Natural Gas Men At Shreveport Session

SHREVEPORT, La., Jan. 19.—Resolutions embodying recommendations included in E. N. Watkins' paper on classification of accounts for natural gas producing pipe line and distributing companies, and for continued research into the problem of measuring the open-flow capacity of gas wells without waste of gas as discussed in papers by E. L. Rawlins, of the United States Bureau of Mines at Bartlesville, and Donald E. Fuellhart, of Brokaw, Dixon, Garner & McKee, consulting engineers, of Shreveport, were unanimously adopted by the Southwest Division, Natural Gas Department, American Gas Association, at the closing session of the Shreveport convention.

These resolutions, constituting new policies of the division, follow:

By E. L. May, Dallas Gas Co.: "That it is the sense of the conference of the Southwest Division of the Natural Gas Department that the problem of research to determine the open flow of gas wells without waste of gas is deserving the attention and support of the entire organized industry, and we recommend this problem to the attention of the department."

By W. C. Grant, secretary: "That the Southwest Division of the Natural Gas Department realizes the need for uniformity in classifications of natural gas accounts, and suggests the creation of a committee to further this course throughout the industry, reporting to the managing committee and to the annual meetings of the department; provided, due consideration is given to classifications already operative under jurisdiction of various state regulatory commissions.

"That we commend the commercial sales educational efforts of the American Gas Association to the favorable attention of our companies."

By H. E. Montgomery, of the Empire Cos., Bartlesville, Okla.: "That in view of the fact that the Southwest is now the heart of the nation's natural gas production, and in consideration of the importance of this great industry to this section and to the country at large, that we continue the annual conventions of the division, which have been well attended and have enjoyed the enthusiastic support of southwestern gas men.

"Further, That there be created within the division technical and commercial committees charged with the duty of developing activities along these lines in this section, to be tied in with the activities of the industry nationally."

NATURAL GAS SUPPLY FOR BUT YEAR IS OUTLOOK IN MUSKEGON FIELD

By Special Correspondent

MUSKEGON, Mich., Jan. 19.—Discovery of some new reservoir of natural gas either in some other part of Muskegon County or western Michigan, or in the deeper formations in the present Muskegon Field, will be necessary to insure Greater Muskegon with a supply of the natural fuel for more than 300 working days, or about one calendar year, judging by a new survey of the prospects in Muskegon and Laketon Townships.

Completions of the past few weeks have continued to narrow the estimated supply of natural gas in the present Muskegon Field to such an extent that consumers are facing the prospect of having no natural gas available at the end of the second year. Rapidly dropping rock pressures are reported both in the Traverse and Dundee gas pay sands.

Natural gas can be expected from an area of no more than three square miles. Using a recognized figure of 1,400,000,000 feet to the square mile with a gas sand averaging about 10 feet in depth, 15 per cent void at an average rock pressure of about 500 pounds during the life of the field, there is an estimated supply of but 4,500,000,000 feet in the proven field.

The Traverse formation today after one year of operation need not be counted upon for any considerable supply. Support for this statement lies in the fact that the Muskegon Traction & Lighting Co. no longer can take gas from the Lima Oil Corp.'s No. 1 M. Figge, SE NW Section 9-10-16, one of two dry gassers completed in the upper Traverse pay sands. Encroachment of water has made it necessary for the Traction company to depend almost entirely upon its Dundee wells.

Rock pressures of the Dundee formation gassers which came in at 920 pounds to the square inch have dropped after less than three months of steady pull by the four existing pipe lines to 750 pounds, nearly 20 per cent. This drop has resulted from the pull of the Muskegon Traction & Lighting Co. of less than 1,000,000 feet a day since September 4, 1928, an average pull of about 3,000,000 feet a day by the Continental Motors Corp.'s pipe line since October 1, 1928, a pull of not more than 1,000,000 feet a day by the West Michigan Consumers Co.'s line since the latter part of November, 1928, and a pull of the Muskegon Pipe Line Co. averaging about 2,000,000 feet a day for less than a month.

Drain on Field

At present these four pipe lines are removing about 11,500,000 feet of natural gas a day from the Muskegon Township Field. Within a few weeks this pull will have been increased at least to 15,000,000 feet a day, including only 2,000,000 feet for wastage from all producing oil wells.

Using 15,000,000 feet a day as the probable average pull on the field, the known supply of 4,500,000 feet in the Muskegon Township area will have been exhausted in exactly 300 working days.

New developments in Laketon Township in all directions except south of the first two wells completed there with an open flow capacity of about 5,000,000 feet of gas a day each indicate that no large supplies of gas need be expected in that part of the present proven field.

New wells have come in as oil producers rather than dry gassers. One of the original gas wells has developed into one of the largest oil producers. The Reed Oil Co. is completing a 4-inch gas line to this part of the field which gives indication of being able to care for all the gas that will be sold from that area.

Dry holes encircle the present known gas field in Muskegon Township confining it to an area about 2 miles long and 1½ miles wide.

Dusters Outline Limits

"Dusters" which outline this part of the field are: Kelley Goldboss' No. 1 Marquard and Birch wells on the west; the Northern Oil & Gas Co.'s No. 1 Curtis well on the northwest; the Reed Oil Co.'s No. 1 Torrent well on the southwest; the Continental Motors Corp.'s No. 2 fee well on the south; Brien & Brien's No. 1 Fagan well on the southeast to east; the Muskegon-Ottawa-Crude Oil companies' No. 1 and No. 2 Baker on the northeast; the Eagle Oil Corp.'s No. 1 Damm well, also on the northeast; and the Johnson Oil Refining Co.'s No. 2 Van Allsburg and the Victor Oil & Gas Co.'s No. 1 Collins on the north.

In addition to these indications of the limits of the field, there are the new oil producers being brought in west and a little northwest toward Laketon Township. This seems to preclude the discovery of new supplies of gas in this direction.

Grand Haven Franchise

The proposal to grant a 30-year franchise to The Industrial Gas Co. of Michigan to supply natural gas from the Muskegon Field and any other part of western Michigan, where gas may be found will be voted upon by the citizens of

(Continued on Page 172)

EUREKA NATURAL GAS IN EAST TEXAS FIELDS

SHREVEPORT, La., Jan. 19.—Eureka Natural Gas Co., recently organized by a group of New York bankers and associates, has acquired 7,000 acres in the Bethany and Waskom districts of Panola and Harrison Counties, Texas, including producing and nonproducing properties, part of which was the E. R. Ratcliffe properties, and announced a million-dollar development program, including a series of 15 deep wells during the year, according to C. L. Jackson, vice president and general manager, and A. E. Stilger, president, who were in Shreveport attending the gas convention. The company has completed three wells in the territory since taking over the properties and has one drilling. Two of these were deep wells around 2,600 feet, and one was in the chalk at 1,650 feet. They also have options on some production and undrilled stuff in the Richland and Monroe districts.

Beside the new work on their drilling program, they plan to deepen the smaller producers in the shallow sands and other old tests that have gone dead, or nearly so, marketing their gas at present to the Dixie-Gulf pipe line. The drilling schedule contemplates 2,700-foot tests in Bethany and 2,800 feet in Waskom, horizons which have been little prospected in the past, but developments of which, in the Bethany district, has already begun with a serious of a half-dozen or so producers.

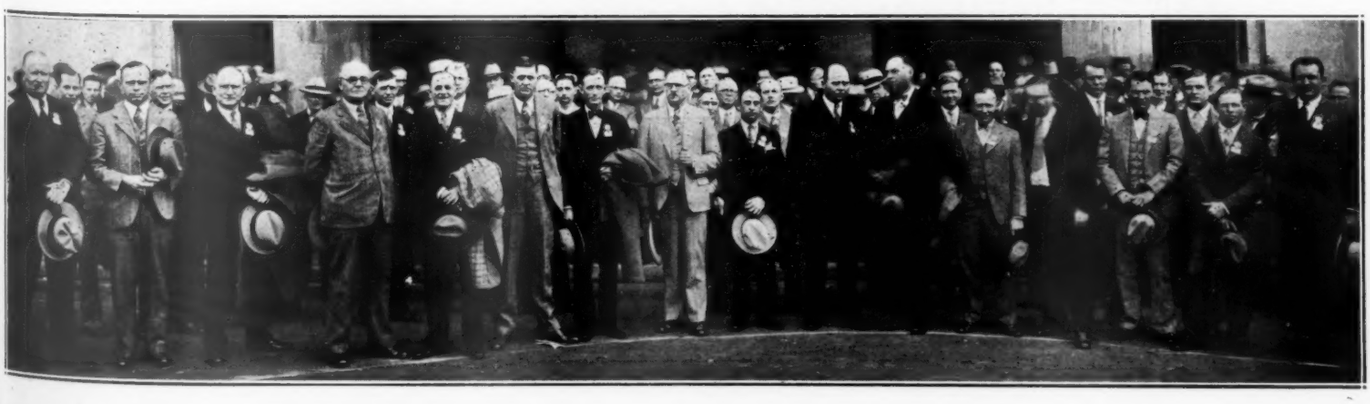
APACHE CO. BUYS TWO PLANTS

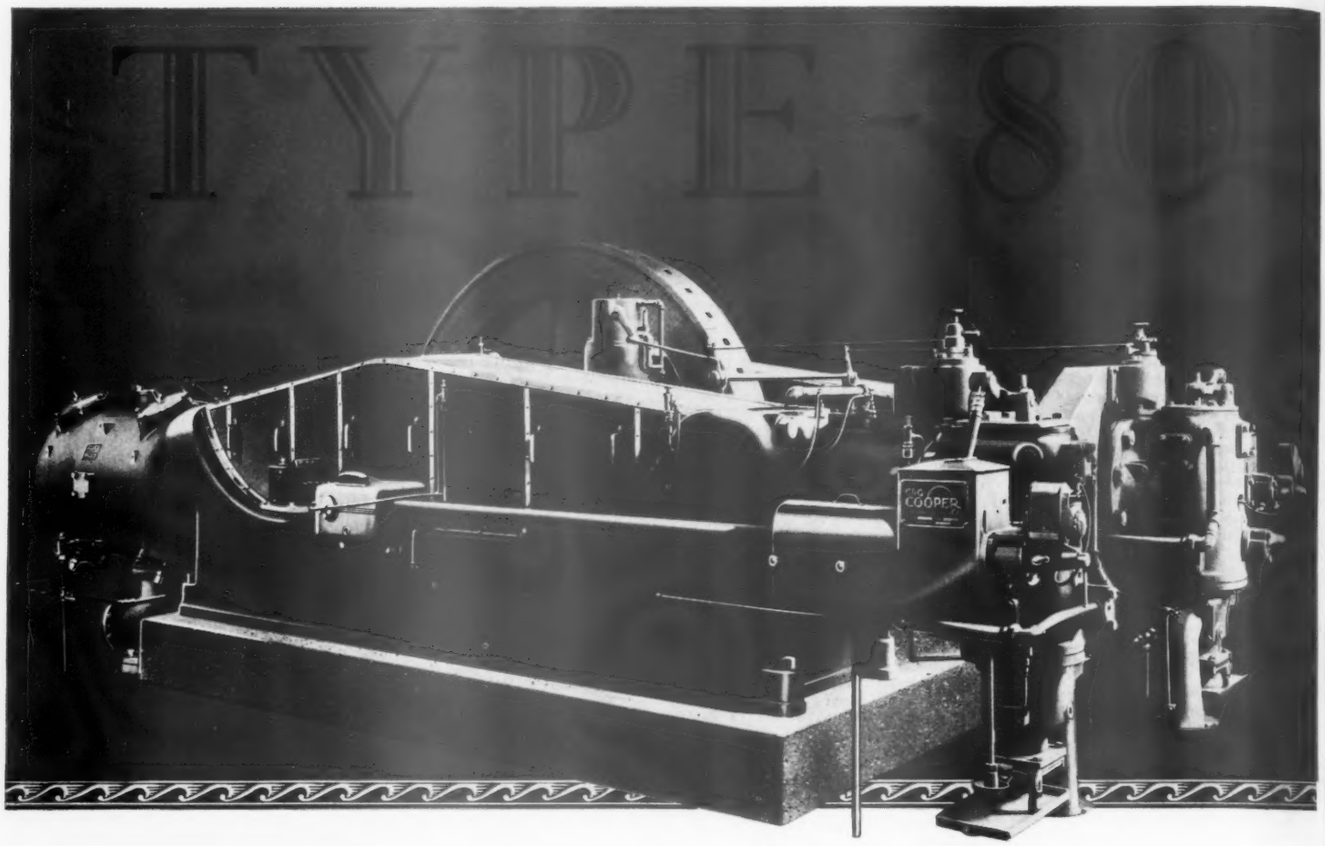
The Apache Gas Co. has purchased the natural gas distribution systems, which serve Perry and Lovell, Okla., according to announcement by Wilbur J. Holleman, Oklahoma City, vice president. The company intends to supply gas from the Logan County fields. The natural gas system at Perry was owned by the Perry Service Co., and the Lovell system by Earl W. Baker Utilities Co. There are more than 1,000 natural gas patrons at Perry and 54 at Lovell. Officers of the Apache Gas Co. are: S. M. Williams, Jr., Tulsa, president; B. R. Williams, Tulsa, and Wilbur J. Holleman, Oklahoma City, vice presidents. Mr. Holleman is also general counsel.

SALE OF NATURAL GAS PROPERTY

The Penn-Ohio Gas Co., one of the many Benedum-Trees companies of Pittsburgh, Pa., has acquired all the holdings of the Wittmer Oil & Gas Co., and the Lisbon Oil & Gas Co. in Ohio, which consists of better than 100,000 acres and 100 wells. Daniel S. Webber & Son of Columbus, Ohio, were the brokers in the transaction.

AT ANNUAL CONVENTION, SOUTHWEST DIVISION, NATURAL GAS DEPARTMENT, A.G.A., SHREVEPORT, LA.





The 1929 Cooper Type-80 Is a Still Better Gas Engine

Every year the Cooper Type-80 170 H.P. gas engine driven compressor has been improved. A number of refinements in both design and materials have been added which make it a still better value for 1929.

It will always be a four-cycle single-acting engine—simple to install and operate. Compared on the basis of fuel economy, lubricating oil consumption, installation cost, maintenance cost, percentage of hours on the load, and earning capacity, there is nothing to equal it for the service which it meets.

General managers, stockholders, superintendents, operators—no one of them ever regrets his choice of a "Cooper."

1116 Magnolia Bldg., Dallas, Texas 649 S. Olive St.,

COOPER

This Year You Will Hear More About Cooper Type -19's

The Cooper Type-19 is a horizontal double-acting gas engine built as well as a gas engine can be built regardless of price. Very frankly, it sells at a little higher price than lighter weight, higher speed, less carefully designed and built engines. But like most Cooper standard sizes it is built on a quantity basis at the lowest possible cost considering the workmanship and the materials used in it. You are therefore assured of the biggest value for your engine dollar.

For medium size gas compressing stations and large gasoline plants they are showing the lowest power costs. The Cooper Type-19 is built in 200, 400 and 760 H.P. sizes.

The C. & G. Cooper Co., Mount Vernon, Ohio

Los Angeles, Cal. 615 Kennedy Bldg., Tulsa, Okla.

ENGINES

MEN KNOWN IN OILDOM

William Jervis

William Jervis, who was recently appointed vice president in charge of marketing for the Marland Refining Company, is widely known in both sales and traffic circles of the oil industry. For 23 years he was traffic manager of The Texas Company covering a period in which the company became one of the major refinery organizations in the United States.

During the last eight years of his connection with The Texas Company, Mr. Jervis was in charge of railroad sales—chiefly lubricating oils—in addition to his traffic duties. His success in this work was outstanding. After his resignation from The Texas Company he was engaged in oil sales work with headquarters in Chicago until he accepted the position with the Marland company last month.

In his new work Mr. Jervis will have general charge of marketing including tank car and station sales. His headquarters will be in Chicago where new offices have been opened in the Straus Building.

PERSONAL PARAGRAPHS

Wade H. James and Guy Woodward, Tulsa, were recent business visitors in Fort Worth, Tex.

* * *

W. J. Anson, Shreveport, La., spent several days in Houston, Tex., calling on Gulf Coast refiners.

* * *

James H. Satterwhite, general manager of Westcott & Gries, Inc., of Tulsa, was in Dallas, Tex., last week.

* * *

N. C. McGowen, president of the Palmer Corporation of Monroe, La., is making a 10 days' visit to New York.

* * *

Ford Braddish, Fort Worth, Tex., geologist, returned to his offices following a tour of West Texas and the Panhandle.

* * *

Robert B. Violette, Independent Oil & Gas Company, has returned to Fort Worth, Tex., following a trip through New Mexico.

* * *

Levi Smith, of the Big Lake Oil Company, has returned to his offices in West Texas following a business trip to Pittsburgh, Pa.

* * *

F. W. Burford, president of the Burford Oil Company, has returned to his home in Shreveport, La., following a tour made by air through West Texas.

D. D. Kincaid, Fort Worth, Tex., drilling contractor, has returned to his headquarters following a business trip to Southwest Texas.

* * *

C. W. Sipler, of Tulsa, has been appointed Mid-Continent representative for the Victor Balata & Textile Belting Company of Easton, Pa.

* * *

Walter Ritterbush, Phillips Petroleum Company's West Texas land man, has returned to San Angelo, Tex., following a trip to Fort Worth.

* * *

Harold D. Crawford, of the Parkersburg Rig & Reel Company, Parkersburg, W. Va., is visiting the Mid-Continent branch offices of the company.

* * *

W. K. Hughes, chairman of the board of directors of the Continental Supply Company, was a visitor in Houston, Tex., last week.

* * *

H. Brooks Gutelius, general manager of the Continental Supply Company of St. Louis, was a visitor in the Gulf Coast region last week.

* * *

Wood White, of the Sinclair Crude Oil Purchasing Company, visited Casper, Wyo., recently, and returned to his headquarters in Los Angeles, Calif.

* * *

B. A. Hardy, executive vice president of the Dixie Gas Company, of Houston, Tex., visited friends and relatives in Shreveport, La., last week.

* * *

Rodney S. Durkee has been elected director and treasurer of the General Petroleum Corporation of California, succeeding J. Leslie Barneson, resigned.

* * *

Wood Stanley, a few years ago district geologist for the Gulf Production Company at the San Antonio, Tex., office, has returned to San Antonio as a consulting geologist.

* * *

Joseph Zeppa, former secretary and treasurer of the Arkansas Natural Gas Corporation, has been elected vice president in charge of production of the Macmillan Petroleum Corporation.

* * *

L. E. Livingston, representative of the Barco Manufacturing Company of Chicago, Ill., who is located at Fort Worth, Tex., has just completed a trip over the Louisiana-Arkansas territory.

* * *

E. Lloyd Byer has returned to the Tulsa offices of the Parkersburg Rig & Reel Company as city salesman. Mr. Byer recently has been employed by Troy A. L. Bowen, drilling contractor of Tulsa.

* * *

George D. Locke, vice president of the Barnsdall Refineries, Inc., will leave New York January 26 on a visit to European points. Mr. Locke expects to be away from his Chicago offices about six weeks.

* * *

R. Ogarrio, New York, newly elected vice president and manager of production for The Texas Corporation, is spending a week in Houston, Tex., and the Gulf Coast on a tour of the company's offices and holdings.

* * *

Charles A. Monroe, of Chicago, president of the New York Oil Company, spent a few days in Casper, Wyo., at the company's offices. Mr. Monroe became president of this company upon its sale and reorganization last spring.

* * *

R. J. Scanlan, formerly chief of the materials inspection and testing department of the T. E. Murray Company, Inc., New York, has now joined the general sales department of the Walworth Company, as sales engineer, with headquarters in New York.

* * *

A. E. Humphreys, Denver, Colo., president of the Humphreys Corporation, has been visiting the Houston, Tex., offices of the company the past week, flying here in his private plane from Brownwood, where he had been looking over some of his company's property.

* * *

O. C. Brewster, of the Casper, Wyo., refineries of the Standard Oil Company of Indiana, will be one of several Standard men assembled from various divisions to visit the new refinery of the Pan-American Petroleum Company on the Isle of Aruba off the coast of Venezuela.

D. D. Christner, Marland Production Company geologist, has returned to San Angelo, Tex., from a business trip to Ponca City, Okla.

* * *

Bringing as passengers Mr. and Mrs. Harry Johnston, their son and Mrs. J. McConahay, the plane Miss Vico owned and operated by the Utah Oil Refining Company arrived in Los Angeles for a stay of about 10 days.

* * *

F. O. Prior, former general superintendent, was elected vice president and director of the Dixie Oil Company, of Shreveport, La., at the annual meeting. A. W. Peake was re-elected president and A. M. McCorkle, vice president and secretary-treasurer.

* * *

J. Allinson, chief engineer for the past three years of the Marland companies, is leaving Ponca City, Okla., with his family to live in London, England, where he is to be the London representative of the McGee Construction Company of Cleveland, Ohio.

* * *

J. C. Jackson, well known in supply circles, formerly sales manager for Slater Brothers Derrick Company and later with Emsco Derrick & Equipment Company, has joined the sales force of the Braden Steel Corporation, Tulsa, in charge of derrick sales.

* * *

Archibald M. Bowman, general purchasing agent of the Humble Oil & Refining Company at Houston, Tex., who is also president of the national association of purchasing agents, is to make an address January 22 in Tulsa before the Purchasing Agents Association.

* * *

E. R. Miller, assistant manager of the mechanical sales department of the B. F. Goodrich Rubber Company, and George A. Livermore of the same concern, known in all oildom, have been making a tour of the Mid-Continent oil field, and last week were in the Gulf Coast region.

* * *

A. B. Patterson, formerly of the Colorado division of The Texas Company with headquarters at Denver, has been transferred to Lafayette, La., where division offices for South Louisiana operations have been established. Mr. Patterson will be superintendent of the southern Louisiana division.

* * *

L. T. Barrow, formerly of the San Antonio, Tex., offices of the Humble Oil & Refining Company, has been transferred to Houston, Tex., where he will act as chief geologist to succeed Eugene Holman, who has resigned to accept a position with the Standard Oil Company of New Jersey, at New York.

* * *

D. B. O'Neil, formerly district manager of The Texas Company in the San Francisco territory, has been appointed district manager of The Texas Company for the district covering California, Arizona and Nevada. A. H. Persons was appointed assistant district manager simultaneous with the selection of Mr. O'Neil.

* * *

Warren N. Craddock for six years resident geologist in the Ventura Avenue Field of California for the Shell Petroleum Corporation, has resigned to become chief petroleum engineer of the recently organized Pacific Petroleum company. Mr. Craddock's office will be located in Los Angeles at the principal headquarters of the company.

* * *

Frank H. Coates and Paul R. Jones, directors, and W. A. Sinnsheimer, head of the oil division of the Cities Service Company, of New York, were guests of the officers of the Arkansas Natural Gas Corporation, of Shreveport, La., at a dinner during the annual convention of the Southwestern Division, Natural Gas Department, American Gas Association in Shreveport.

* * *

R. C. Holmes, president of The Texas Company, has been elected president of The Texas Company of California succeeding Jacques Vinmont, who recently resigned to become chairman of the board of the Pacific Western Petroleum Company. Clarence E. Olmsted, vice president and general manager, is in direct charge of The Texas Company's California activities.

Quality of Fuel Supremely Important

Aviation Gasoline Must Possess High Total Volatility Combined With Low Vapor Pressure and High Knock Rating

By George Granger Brown*
University of Michigan

It is generally conceded that successful flight in a heavier-than-air vessel, or airplane, would probably have been accomplished before that of the Wright brothers 25 years ago, if the internal combustion engine had been available. The lifting power of an airplane depends entirely upon its velocity through the air, which in turn depends upon the power developed by the motor. If this power is not sufficient to give the plane sufficient velocity through the air to lift the weight of the power plant, a successful flight is impossible. This was the condition encountered by many of the early experimenters who tried to use steam power in airplanes.

The early internal combustion engine used by the Wright brothers weighed about 20 pounds per horsepower. This relatively light weight of the power plant combined with the superior knowledge of aerodynamics possessed by the Wright brothers enabled them to make the first successful flight in a plane under its own power. Just as an airplane will not fly without power, the airplane motor will not run without fuel. For this reason there must be fuel before there is an engine, and an engine before there is an airplane. As no adequate source of aviation fuel, other than petroleum or natural gasoline, has yet been found the petroleum industry is essential to aviation. However, this condition may not always be true, unless we clearly recognize the importance of quality as well as quantity in aviation fuels. The Graf Zeppelin was fueled in its recent transatlantic flight largely by coal gas rather than gasoline. It was also reported that the Bremen in its flight across the Atlantic Ocean was fueled largely by benzol, another product derived from coal. Evidently these fuels possess peculiar advantages compared with commercial aviation fuel produced from petroleum, or they would not be used.

Aviation Expanding Rapidly

Aviation is expanding rapidly in this country and consumption of aviation fuel is mounting to such figures as to demand its recognition as an important market for petroleum products. This fact is recognized by the larger companies, many of whom are making special studies in order that they may produce and market a highly satisfactory aviation fuel. The large number of airports throughout the country which must be serviced by the local distributors, if they are to maintain their present important position, make aviation fuel quality a subject of importance not only to producers, but also to those whose problems are confined to distribution.

Important as motor performance is to the motor car driver, few laymen can appreciate that a 10 or 15 per cent loss in revolutions (r.p.m.) may mean life or death to the pilot, while being practically unnoticed by the average motor car driver. Although the relation of motor fuel characteristics to engine performance is recognized to be more or less important in the case of motor cars, the practical necessity of using only those fuels in aviation that will give perfect performance needs emphasis. The papers throughout the country recently reported two fatal crashes which were believed to be due to the use of fuel unfit for airplane motors although apparently satisfactory for use in motor cars.

Although the same qualities, volatility and knock rating, are of importance in motor fuels as in aviation, they are demanded to a much higher degree in aviation fuels.

*Head of Research Department, Natural Gasoline Association of America.

Total volatility, or complete vaporization of the fuel, is a practical necessity in the multicylindered aviation motors. The intake manifolds which lead the mixture from the carburetor to the numerous cylinders are necessarily long and complicated, containing many bends. If the fuel is completely vaporized near the carburetor, the mixture of air and fuel vapor will be distributed in a uniform manner to all the cylinders. If the fuel is only partly vaporized as it leaves the carburetor, the liquid particles collect on the walls of the manifolds and are carried along by the air stream at a considerably lower velocity. Under these conditions, some cylinders receive relatively large amounts of liquid along with the air and fuel vapor, while other cylinders receive only air and fuel vapor. This causes uneven distribution of the fuel to the various cylinders, makes uneven running of the motor with loss of power, and frequently causes valve and sparkplug trouble.

In the motor car this problem has been partly solved by heating the intake manifold directly above the carburetor. This is extremely undesirable in aviation motors and far less successful than in motor cars. Because of the long, complicated manifolds on aviation motors exposed to the air, local heating near the carburetor is not as effective as in motor cars. The mixture heated near the carburetor may become cooled in other parts of the manifold causing partial condensation of liquid fuel in these parts. The engine in a motor car is protected by the hood so that the manifolds have less opportunity to become cooled.

Volumetric Efficiency Reduced

Heating the charge in order to vaporize a fuel of low volatility decreases the volumetric efficiency and power developed by the motor and at the same time increases the tendency of the mixture to knock.

For these reasons, heating the manifold of aviation motors is not a satisfactory way of obtaining even fuel distribution, and it is particularly important that aviation fuels be completely vaporized at low temperatures. This fact is recognized by the specifications for Domestic Aviation Fuels, which demand a much lower temperature at the 90 per cent point on the A.S.T.M. distillation.

For purposes of comparison the temperatures of the 90 per cent point as given in the following tabulation may be used to indicate the relative temperatures at which the corresponding fuels are completely vaporized:

Fuel specifications—	90% on A.S.T.M. distillation
U. S. Motor fuel	392°F.
Domestic aviation	311°F.
High volatile aviation as commercially produced from crude oil	285°F.
Fighting-grade aviation	257°F.
Aviation fuel as commercially produced from natural gasoline	227°F.

In many ways these figures speak for themselves. The third fuel mentioned above is superior to the domestic aviation specifications and is being sold in competition with domestic aviation gasoline. The fourth fuel, fighting-grade aviation, has been practically discontinued, but the fact that fighting-grade aviation demands a lower 90-per cent point than domestic aviation clearly indicates the importance of this point in the specification for aviation fuels. Within the last two years fuels of the type represented by the last one mentioned above have been developed and are proving extremely desirable because of their perfect performance even in cold motors.

Danger From Vapor Lock

Although low 90 per cent points on the A.S.T.M. distillation are very desirable in aviation fuels, extremely low 10 per cent points are indications of possible danger due to vapor lock. This subject was discussed from the standpoint of the motor car in The Oil and Gas Journal for October 18, 1928, on page 145, and much the same statements may be made in regard to vapor lock in aviation motors, except the temperature limit should be lower. The temperature of the fuel in the lines and carburetor of an airplane seldom exceed 100 degrees to 105 degrees Fahrenheit under the same conditions of operation as cause the corresponding temperatures in a motor car to reach 135 degrees to 145 degrees Fahrenheit.

Vapor lock in airplanes is generally the result of poor design and location of the fuel lines, which cause these to operate at higher temperatures than necessary. These high temperatures cause the more volatile fuels used in aviation to vapor lock in the fuel pump. However, care must be taken not to supply a fuel possessing too high a vapor pressure at the temperature at which the fuel lines operate.

In a rough way the 10 per cent point on the A.S.T.M. distillation may be taken as indicating the temperature at which that fuel exerts atmospheric vapor pressure. For this reason the 10 per cent point of an aviation fuel should never be below 100 degrees Fahrenheit if freedom from vapor lock is to be assured. Even then it is important that the fuel be carefully rectified so as to be free from any appreciable quantity of propane or similar material such as propyline which may be introduced by absorption of gases in the cracking process.

Co-operation Imperative

The importance of eliminating vapor lock can be solved only by the combined efforts of the manufacturers of airplanes and the marketers of aviation fuels. In the past the exact cause of vapor lock has not been well understood, and the present specifications for domestic aviation gasoline which do not allow the 5 per cent point on the A.S.T.M. distillation to be between 122 degrees Fahrenheit were written in a vain attempt to insure freedom from vapor lock even in those planes whose fuel systems were poorly designed.

The importance of low weight of the power plant has already been indicated. Properly speaking, the fuel used is a vital part of the power plant and should always be so considered in estimating the pay-load capacity of a plane. The early Wright planes were compelled to operate on such a close margin that in the early flights only 1 gallon and later 5 gallons of fuel were carried, as compared to 50 or several hundred gallons in modern planes. The weight of a gallon of fuel was not important to the Wrights, but is no small item in modern aviation. This is another reason extremely volatile

(Continued on Page 88)

EIGHT AIR TRANSPORT LINES ARE PLANNED FOR TEXAS

Plans for eight air passenger lines to be put into operation in Texas as soon as needed equipment can be obtained have just been announced by Tom Hardin, general manager for Texas Air Transport, Inc. The lines will be known as the T.A.T. Flying Service, Inc., and will be operated as a subsidiary to the transport company.

The air mail routes now operated by T.A.T. will be followed by two of the lines. The schedules for passenger service and mail service will be different on the two lines. One of these lines runs from Fort Worth and Dallas to Waco, Austin, San Antonio and Laredo, and the other runs from Fort Worth and Dallas to Waco, Houston and Galveston.

The six other lines will be between Fort Worth, Dallas and El Paso with stops at several intermediate points which have not yet been selected; from Fort Worth and Dallas to Wichita Falls and Amarillo; from Fort Worth and Dallas to Texarkana; from Amarillo to San Antonio; from San Antonio to Houston and from San Antonio to Brownsville.

The lines will use Travel Air cabin job monoplanes equipped with the new Wright J6 or 300-horsepower motors. E. G. Rhenstrom, formerly with the Fairchild Airplane Corp. of New York, and one of the pilots in the recent Fort Worth Aerocade through West Texas, has been named manager of operations for the passenger lines.

In addition to the passenger lines, T.A.T. will maintain air taxi service, parts depot and training school at each of the cities named as termini for the lines.

Enthusiasm Soon Takes Place of Doubt

Oil Companies Which Manifest Only Cautious Interest at First Become Ardent Supporters of Aviation. The Texas Company an Example

By Thomas F. Smiley

Although The Texas Company and its subsidiaries have taken their places among trail-blazers in the use of aircraft by the oil industry it was scarcely two years ago that most of the executives of that big petroleum organization were avowedly from Missouri. They were no more precipitate about adopting the airplane for practical transportation purposes than were those of other oil companies—and oil companies, like the rest of the commercial world, were dubious at first.

B. E. Hull, president of the Texas Pipe Line Co., a subsidiary of The Texas Company, is credited with bringing about the purchase of the first of the two planes now operated by the Texas organization. Mr. Hull, convinced that the airplane was destined to revolutionize transportation methods, began urging its merits. He sought unceasingly to impart to fellow executives the faith that was in him. He believed in the airplane not merely as a clever transportation device holding much promise for the future, but as a thing of proven practicability offering clear advantages of which a modern, up-and-going oil company should avail itself, not after a while, but now.

Mr. Hull was supported whole-heartedly by Ernest J. Nicklos, then division manager of The Texas Company's Oklahoma-Kansas division. Their enthusiasm was contagious and their company associates, being sane, open-minded business men, one by one conceded the logic of the arguments presented, with the result that last March R. C. Holmes, president of The Texas Company, approved the purchase of a tri-motored cabin liner, which was christened Texaco No. 1. Six months later the company bought a single-motor Lockheed-Vega monoplane, designated as Texaco No. 2. It is needless to say that Mr. Holmes is a thoroughgoing believer in aircraft for the oil industry.

Wanted to Keep Him a While

In this connection it is recalled how once in the early days of the missionary efforts begun by Mr. Hull and Mr. Nicklos the latter was talking airplane to Mr. Holmes. In the course of the conversation he expressed his own eagerness to use the aerial method of travel. The Texas president, at the time unconvinced of the safety of flying, responded, "Why, Nicklos, we're not ready to get rid of you yet."

The first ship bought, Texaco No. 1, was assigned to the sales department, which worked out a schedule by which it visits all parts of the country. On these flights the pilot, Capt. Frank M. Hawks, is accompanied by various district managers, depending upon the territory covered by the flight. The second plane, quite appropriately, it would seem, was assigned to Mr. Hull himself, who has been dubbed "the flying president of the Texas Pipe Line Co." His ship is piloted by Matt A. Nieminen. Mr. Nicklos, co-crusader with Mr. Hull, laughingly refers to himself as a "godunk," which being interpreted means a man who likes to fly in the other fellow's ship. The two ships now in operation are looked upon as forerunners of a fleet of planes to be used for commercial purposes and in the promotion of aviation activities. The successive stages that have marked The Texas Company's transition from cautious interest in the airplane to ardent approval are common to virtually all the growing number of oil companies that have adopted this mode of transportation.

The Texaco No. 1 is used as a testing ground and research laboratory for petroleum products used in aircraft motors, as a means of swift and reliable communication and transportation of executives, and as a good-will ambassador to the public. The company operates throughout the whole 48 states of the Union and it is imperative that its officials have the quickest means of movement between the various fields of interest.

Careful Records Made

As the plane wings its way about the country a careful analytical record is made of the material used in the three motors. Reactions of certain grades of oil and gasoline under certain sets of conditions are analyzed and the findings are turned over to the company for use in different departments in the development of products specifically designed for modern airplane motors.

Texaco No. 1 was an entrant in the National Air Tour of 1928 and during the National Air Races held in Los Angeles The Texas Company maintained an aviation supply base from which were dispensed aviation gasoline and airplane motor oil for visiting planes. Texaco No. 1 serves not only as an envoy of good will for the company, but for aviation in general. A good-will flight made in 1928 touched the greater part of the United States and it found the public's interest in aviation at high pitch.

With producing properties in Texas, Oklahoma, Louisiana, Wyoming, Colorado, Kansas, Arkansas and New Mexico, besides refining and asphalt plants in several states and far-flung marketing interests, The Texas Company finds many of its transportation problems simplified by the airplane. In November, 1928, a large party of company officials, most of them from New York, inspected the Greater Seminole region and other producing areas from the air. Those in the tour included R. C. Holmes, president; E. E. Schreck, secretary to the president; W. G. Mitchell, assistant to the president; C. B. Ames, vice president; R. Ogarrio, in charge of the producing department; W. S. S. Rodgers, T. Reiber and F. T. Manley, vice presidents; J. N. Hill, H. G. Lapham, J. H. Lapham, Albert Rockwell and Eugene M. Stevens, directors, and B. E. Hill, president of the Texas Pipe Line Co. and the Texas-Empire Pipe Line Co. Roads were in such condition that the inspection tour could not have been made by automobile. Both of the company's planes were used.

Director Flies His Own Ship

J. H. Lapham, one of the company directors who participated in the inspection tour, was already a seasoned airman. Mr. Lapham is himself a licensed pilot and since April, 1928, he has been flying his own ship. Residing in San Antonio, Tex., he attends all directors' meetings in New York, making the trip in his Spartan airplane. He joined with Mr. Hull and Mr. Nicklos in unqualified support of air transportation for the oil industry.

One of the most interesting flights made by the Texaco No. 1 was that on May 23, 1928, when Mr. Nicklos; L. J. Larue, of Houston, Tex., in charge of the company's telegraph and telephone systems; Captain Hawks, the pilot, and Mrs. Hawks rode by daylight from Tulsa to Los Angeles. Hopping off as dawn was breaking at 4:10 o'clock, Captain Hawks followed a course almost as straight as the crow's for his destination on the Pacific Coast. Stops were made for breakfast at Amarillo, Tex., and luncheon at Phoenix, Ariz. Fresh supplies of gasoline were taken on at both places. The ship arrived in Los Angeles at 7:05 o'clock in the evening and a short time later Mr. Nicklos and Captain Hawks with Vice President Rodgers, who had met them at the landing field, were seated comfortably in the dining room of a Los Angeles hotel, discussing incidents of a wonderful day as they leisurely ate their dinner.

This trip had no object other than satisfying Mr. Nicklos and his companions that a Tulsa-to-Los Angeles flight could be made by daylight safely, pleasantly and swiftly. The ship sailed over country wild, unsettled and as trackless as the ocean.

Swift Trip to A.P.I. Meeting

When the annual meeting of the American Petroleum Institute was held in Chicago December 3-7, 1928, Mr. Nicklos made the trip by airplane in 4 hours and 45 minutes, leaving Tulsa at 8:30 o'clock in the morning and arriving in Chicago at 1:15 p. m. His friends who went by rail consumed 19½ hours on the way, sleeping (or trying to sleep) in a Pullman berth instead of their own beds.

Captain Hawks was a United States Army flier and upon returning to civil life he put his skill to use as a commercial aviator. He has traveled more than 780,000 miles by air.

The monoplane bought by The Texas Company for the use of Mr. Hull carries three passengers in addition to the pilot. One of the first uses to which Mr. Hull put his ship was in supervising construction of pipe lines in West Texas and the Texas Panhandle and the new line from Tulsa to Lockport, Ill.

Matt Nieminen, who serves as pilot for the Texaco No. 2, is an air reserve captain, who graduated from Kelly Field, Texas. Mr. Hull has known Nieminen as man and boy and has flown with him at intervals for the last 10 years as occasion offered opportunity. They inspect pipe line surveys and completed jobs from the sky at relatively low altitudes. Last October they flew northward and eastward, sometimes at 125 miles an hour.

Mexico was the scene of Captain Nieminen's first work after he left Kelly Field a licensed pilot. He carried pay rolls for mining and oil companies and took passengers to all parts of the republic. He is credited with being the first man to see Mexico City and the United States the same day. The flight was made in six hours from Brownsville, Tex., to the Mexican capital. Some of his adventures are told interestingly in the November issue of the Texaco Star.

Crazy Man as Passenger

In the latter part of 1927 Nieminen went to Alaska to fly commercial airplanes for the Anchorage Air Transport. His jobs here were varied, his adventures many. Gold prospectors in search of stakes, photographers, and passengers were carried to isolated parts of the country—whirring for hundreds of miles over the wastes. Once he carried a woman with a seven weeks old baby to Flat, Alaska. Arrived there he was asked to take a crazy man to Fairbanks. Nieminen laughed when asked if he was afraid. "No," he said. He had a fire extinguisher in the cockpit. If the man became violent he would play the chemical on him; this failing, there was always the monkey-wrench. The passenger was taken aboard, wrapped in a blanket and tied so that he couldn't use his hands. As the plane rose he tore his hands free and waved a good-bye to his friends below. Later he seized the blanket and threw it to the wind. Then he settled down to enjoy the trip, giggling to himself and complaining of the cold. Nieminen was unperturbed.

It was when he arrived in Fairbanks that Nieminen heard that no word had come from the Fox Film Corp.'s flyers. An appeal was made for help in finding them. Nieminen volunteered. The three men, who were Jack Robertson, Arctic guide, Charlie Clark, cameraman, and Russell Merrill, pilot, had taken off by air from Fairbanks for the coast of the Arctic Ocean. They were to take moving pictures of reindeer herds and the Eskimo whalers and sealers, an unprecedented feat. About 150 miles out they were forced down by thick fog and were soon bogged in the heavy snow. All their attempts to dig a runway for another take-off were heart-breakingly futile and they remained with the plane for days until the food supply was down to one cup of boiled rice and a little chocolate.

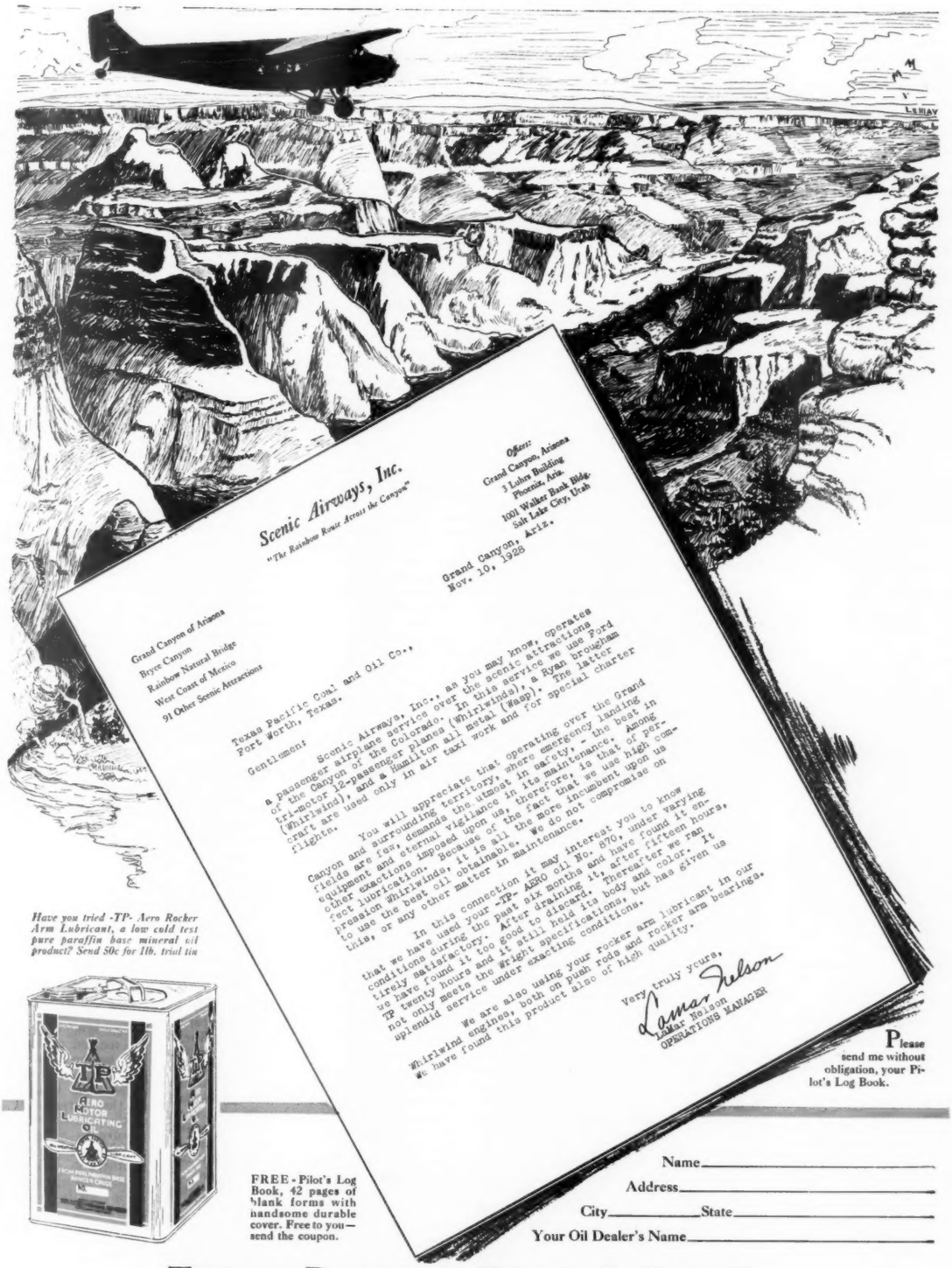
Wander Hopelessly in Snow

Alarmed that no help had come, two of the men set out over the snow for Point Barrow, leaving Pilot Merrill in case relief planes should locate him. For days the men wandered in the snow, nearing exhaustion and almost hopeless. They had to drink melted snow, which contains no mineral salts. They craved acid fruits and promised themselves feasts of pineapple and grapefruit when they reached civilization. They ate chocolate bars.

On June 1 Nieminen, who had been searching for days, passed over a sandy beach about 40 miles from Barrow. Be-

(Continued on Page 81)

Matt A. Nieminen standing beside the Texaco No. 2.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West Coast of Mexico
91 Other Scenic Attractions
Texas Pacific Coal and Oil Co.,
Fort Worth, Texas.
Gentlemen:
a passenger Scenic Airways, Inc., as you may know, operates
of the Canyon of the Colorado. In this service we use Ford
tri-motor 12-passenger planes (Whirlwinds), a Ryan brougham
(Whirlwind), and a Hamilton all metal (Wasp). The latter
craft are used only in air taxi work and for special charter
flights.
Canyon and surrounding territory, where emergency landing
fields are few, demands the utmost in safety, - the best in
equipment and eternal vigilance in its maintenance. Among
other exactions imposed upon us, therefore, is that of per-
fect lubrication. Because of the fact that we use high com-
pression Whirlwinds, it is all the more incumbent upon us
to use the best oil obtainable. We do not compromise on
this, or any other matter in maintenance.
You will appreciate that operating over the Grand
In this connection it may interest you to know
that we have used your -TP- AERO oil No. 870, under varying
conditions during the past six months and have found it en-
tirely satisfactory. After draining it, after fifteen hours,
we have found it too good to discard. Thereafter we ran
TP twenty hours and it still held its body and color. It
not only meets the Wright specifications, but has given us
splendid service under exacting conditions.
We are also using your rocker arm lubricant in our
Whirlwind engines, both on push rods and rocker arm bearings.
We have found this product also of high quality.
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Putting Wings on the Geologist's Mule

Airplane and Special Photographic Outfit End Necessity for Scaling Cliffs, Scrambling Through Jungles and Fording Streams

By L. T. Eliel
Pacific Coast Representative-Fairchild Aerial Surveys, Inc.

For years one of the most picturesque sights in the vast petroleum industry has been the humble and much-maligned "rock hound" and his mule. Seated astride his long-eared and opinionated mount, he has ambled forth in solitude to spend many weary weeks in quest of geological information. He has crossed deserts, forded exceedingly wet rivers and clambered laboriously over mountains. He has had to cut his way through underbrush and scale the flat faces of cliffs. He has spent the major portion of his time "looking for something."

Today, science comes to his aid and gives him a high-powered airplane to help him look, and the finest photographic equipment to help him remember. Before he goes out into the well-known "great open spaces" in these days, he already knows what to find there and where to look for it. He no longer has to imitate the bear in the nursery rhyme which "went over the mountain to see what he could see." He knows what's over the mountain.

And what is more to the point, the chief geologist, sitting at his desk 1,000 miles away, also knows what is over that mountain. The chief wants to know whether the area contains oil, and if so, where. He can send his field crew directly to the points in that area which give the most promising clews. The aerial pictures which have been furnished him in advance definitely eliminates the lost time prospecting in territory which has no geological significance.

Aerial photographic maps and surveys began to assume importance in oil geology in the early part of 1927. During the short period since that time, more than 5,000 square miles of territory have been mapped from the air for oil producing companies in the western part of the United States alone. In fact, practically all of the major companies of California now use this service as a regular means of gathering geological information, and one leading organization has already mapped four different areas by this means.

Causing Some Deep Thinking

This condition of widespread acceptance and general use by the leading companies is causing some deep thinking on the part of those companies which have failed thus far to investigate the aerial camera's advantages. They see competing companies completing their field geological work in a small fraction of the time ordinarily required, and in addition, hear reports of important finds which were hidden to the ground crews. The purpose of this article is to explain, to those who are not already familiar with its uses, what an aerial survey is and how the oil producing companies employ it in geological work.

An aerial photographic survey, for geological purposes, is made by taking a series, or several series, of overlapping photographs at regular intervals from an airplane flying at a height of 15,000 feet over the ground. The lens of the camera point vertically downward through a hole in the floor of the airplane's cabin, and at this altitude each 7 by 9-inch photograph covers an avea of approximately 2 miles by 2½ miles, at a scale of about 1-inch to 1,500 feet. The cutting and fitting in the laboratory, together with the unsteadiness of flying, combine to reduce this area to about 1 square mile to each picture on the finished map These pictures are the material from which the aerial map is made. A print from each negative is made, indexed and delivered to the chief geologist or the field crews ready to enter the territory.

Geologists require various degrees of thoroughness in a map, depending on the purpose for which the area is being studied. The aerial pictures which the chief geologist now has may be used for a variety of purposes, therefore, depending on the extent of the information desired. If it is only necessary to trace some obvious feature which can be seen on the uncorrected prints, he assembles them loosely before him and makes his plans accordingly. He can then give the prints to his field men, with instructions pertaining to any certain spot in the entire area.

Gets Precise Map If He Wants It

However, there are times when he needs the most complete information possible. Here the extreme flexibility of the service becomes apparent, for, with no duplication of time or effort, the same pictures which he has already used for preliminary guidance are corrected for deviations in scale, tilt of camera, etc., in the photographic laboratory. They are trimmed, carefully mounted together, copied to any convenient size and returned as a precise map, showing every square inch of the area in its exact relationship to every other square inch; with all the features clearly in view and the general topography of the country plainly in sight.

One of the chief advantages of aerial photographs is the surprising result noted when aerial photographs are viewed through the stereoscope, by means of which every foot of country may be studied as in plastic relief, just as if a perfect three-dimensional model, showing every bush, trail, and other identifying feature, were on the geologist's desk. From the main topographical features, as viewed through the stereoscope, he frequently sees at a glance the location of the main geological features; such as topographical highs, much of the major bedding, contacts, and general structure, before ever setting out for the field work.

Furthermore, if there is any surface evidence whatever which helps to locate a geological high, it not only may be worked out more easily by the aerial map, but frequently there is no other means of locating it. For instance, an obvious anticline in a certain region in California was lost entirely as the hills gave way to a flat, uncultivated valley, in which all evidence of the bedding was lost on the ground. By using the aerial map, however, the bedding was traced more than 4 miles out into this flat valley, and the anticline axis was projected this same distance, to the unalloyed joy of the geologist.

Aerial Map Saves Hours of Anguish

In country which seems to have been passed through some prehistoric rock-crusher and where the faults all seem to suffer from compound fractures, as in illustration No. 1, the use of an aerial map saves the geologist many hours of anguish. A theory may be worked out and the subsurface formation visualized with much more accuracy and economy of time than by any other known method. By studying his comprehensive picture, with all the features shown in exact relationship, he may be enabled to reassemble the bits which nature apparently has flung around with such reckless abandon and piece them together.

In studying faults, those which are lost to view on the ground may show distinctly in the picture, because of the alignment of faults or characteristic displacements Often bedding which is so gently graduated on the ground as to be invisible will register nicely. The color changes in the picture help the observer see what the formation is. They indicate either a difference in actual soil color or in vegetation; either of which suggests the contact. Bedding, for instance, has been clearly traced in an area in spite of a field of grain 3 feet high.

Contacts also reveal themselves through the shadows caused by the erosion where soft bedding contacts hard. Another way to locate the contact, as in substance such as sedimentary loam against granite, is the complete difference in the character of the drainage, erosion, and the contrast between the vegetation supported by the granite on one side and the sedimentary substance on the other.

To the casual observer a vertical aerial photograph tells a different story from the ordinary ground type photograph. It requires a method of interpretation different from any other. You can turn it around or upside down and there appears to be no top or bottom to it. But there is a way to do everything, and if the geologist will follow one simple rule the puzzle will give up all its secrets.

Always Look South

Always look at an aerial map with the shadows pointing down, or in other words, look south. Of course, this is directly opposite to usual map procedure, and ought to be easily remembered because of it. The human eye never sees any shadows on the far side of the objects causing them for the simple reason that the object hides the shadow. Illustration No. 2 was selected with a view to explaining this phenomenon. With the shadows all pointing down, the proper sense of relief is established at once.

In this picture we see a section of rolling country with several orchards. The fine dots arranged in formation are for the most part citrus groves, while the larger precisely-laid-out areas are walnut trees, well known for their size. This picture was taken in the winter, but being in California there is no general evidence of it. The mildness of the climate and the comfortable temperature do not record on the film of course. But those who know their trees will note that the deciduous walnuts, due to their absence of leaves, have a thin ghost-like appearance, while the sharply defined black trees are in full leaf. The steep slopes of the hills in the lower portion are covered with scrub oak, as seen from the matted vegetation, while in the canyon bottoms the large black images are mostly a good sized species of oak, and show dense foliage. In the hilly section in the lower part of the picture is a distinct fault escarpment, shown in the picture by a dense black series of areas in alignment across the width of the photograph. This fault is not continuous, having been eroded in the canyons, but it is easily seen where the hills are faulted upwards. There is a highway connecting the orchards in the picture, and two or three groups of ranch houses, with their adjacent buildings. The picture was taken at about 15,000 feet, and gives a good idea of the immense amount of territory covered by a single exposure by modern aerial methods.

Use in Office and in Field

The actual use of aerial pictures and maps may be considered under two general classifications, their use in the office and in the field. One of their most valuable assets from the chief geologist's viewpoint is the amazing speed with which information may be gathered. When a new area first comes to the at-

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WHICH GOES TO SHOW THAT COWS ARE RATHER FOND OF AIRPLANES

Fred S. Whitaker, of the Omar Refining Co., Tulsa, is another birdman of the World War who put his skill as aviator to practical use after returning to peace-time commercial activities. He was the first student of aviation graduated from Call Field, Wichita Falls, Tex. After that he was an air service instructor at Gerstner Field, Lake Charles, La. Then he was sent to Arcadia, Fla., where he helped to organize a combat and aerial gunnery school, and he had received an overseas order when the armistice was signed.

After the organization of the Omar Refining Co. in 1923 Mr. Whitaker bought an old army "Jenny" at a government warehouse in Dallas, Tex., paying $800 for it. He used this in traveling between his office in Tulsa and the company's refining plant in Garber, Okla. The plane had seen its best days and before long the trips to Garber were attended by varying degrees of uncertainty owing to the temperamental vagaries of the motor. At this time Fred himself weighed 175 pounds and his brother Joe 200. When the ship was in one of its recalcitrant moods it would refuse to take off with the two brothers in it. If it did consent to go it usually was necessary to stop on the 95-mile flight to Garber to get gasoline. In spite of its eccentricities, Mr. Whitaker had a lot of fun with it and many of his friends went up in the air with him, notwithstanding the speculative character of the outcome.

The last flight of this ship under Mr. Whitaker's ownership was made to Garber with the controls in the hands of his brother Joe, whom he had been coaching. They made a landing near the town. The two had not used this particular field before. They liked its appearance and asked the farmer who owned it if they might continue to use it.

"Sure," was the reply. "You'll give me a ride once in a while, I suppose?"

The brothers assured him they gladly would do that and they were starting for the refinery when the farmer remarked, "By the way, I've heard that cows and mules will damage these here airplanes if they get a chance. Do you think they would?"

The Whitakers laughed and assured the farmer there was no need to worry. When they returned from the refinery they found the linen covering of the wings had been torn to shreds by cows. Supposedly the preparation with which the linen had been treated attracted them. A truck driver bought the plane as it lay, agreeing to pay $300. The initial payment of $75 was the only one he ever made, according to Mr. Whitaker. He salvaged the plane, however, and at last reports was making short flights in it.

Last February, Mr. Whitaker bought another ship, a three-seated one. In the Oklahoma air tour last summer it served as one of the two lead planes. Mrs. Whitaker accompanied her husband on this tour. For travel between the office in Tulsa and the refining plant in Garber and for similar trips Mr. Whitaker says the airplane has marked advantages over other modes of travel. The Garber trip by air requires only about an hour. The same trip by automobile consumes three and one-half to four hours. Mr. Whitaker has a summer home in Bella Vista, Ark., and it is his intention to spend weekends there, flying from his home in Tulsa.

OIL MEN FINANCIALLY INTERESTED IN PLANE

Of interest in connection with the wide adoption of the airplane in the oil industry is the fact that many oil men are engaging in the manufacture or distribution of aircraft. W. G. Skelly, president of the Skelly Oil Co., Tulsa, is heavily interested financially in the Spartan Aircraft Co., which has a modern factory in Tulsa for quantity production of the Spartan airplane and which conducts the Spartan School of Aeronautics.

Erle P. Halliburton, Duncan, Okla., and Los Angeles, Calif., known in every petroleum area of the country through his oil field inventions, has taken over the agency in Oklahoma for the Lockheed Aircraft Co., which manufactures three models of airplanes.

Members of the executive committee of the Phillips Petroleum Co., Bartlesville, Okla., acting individually, have organized the Star Aircraft Co., which is making a small airplane for private ownership. John H. Kane is president of the company and Billy Parker is vice president and general manager.

R. F. Garland, wealthy independent oil operator of Tulsa, is the representative for several airplanes and is one of the organizers of the Garland-Clevenger School of Aeronautics.

AIRPORT SHOULD GIVE FLYER WHAT HE WANTS

The McIntyre airport, Tulsa, was established in 1919, soon after its owner, D. A. McIntyre, had been discharged from service in the World War, and in its 10 years of operation Mr. McIntyre believes he has acquired intimate acquaintance with the needs of airmen. The airport itself, like an increasing number of others being established throughout the country, is essentially a big airplane garage with adequate buildings and an excellent landing field, equipped for giving prompt service to visiting aviators, including repairs. A school of instruction is conducted in connection with the port.

Mr. McIntyre was a lieutenant in the war and was assigned to flying instruction at Wilbur Wright Field, Ohio, and Kelly and Love Fields, Texas. He does much flying personally. "I know what an aviator likes to find when he drops in at an airport," said Mr. McIntyre. "He wants to find a good mechanician for one thing, a man who can check the sparkplugs, file the magneto points, etc. He wants to know that his ship will be gone over carefully while he attends to any business he may have in hand. When he goes around to resume his flight he wants to know that his ship will be warmed up, gassed up and on the line ready to go. It is the business of the airport owner to see that the visiting aviator gets what he wants."

ENTHUSIASM WILL TAKE THE PLACE OF DOUBT

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low he saw two sleeping figures which he took for Eskimos, but coming nearer he saw that one was wearing fur and one khaki. The motor's whir awoke them. They were the cameraman and Arctic guide, gesticulating signals. He made a perilous landing, narrowly escaping a crack. The men were hobbling about weakly. They wept for joy. "One of the men," Nieminen declared, "had lost half a dozen toenails from freezing his toes; the other's tendons had broken down so that he could not walk. They were 40 or 50 miles from Point Barrow when I found them." The third man had wandered from the plane in desperation and was found four days after the first rescue by a dog-musher, snow blinded and asleep on the Arctic Coast 50 miles east of Point Barrow.

Last April Nieminen piloted Earl Rossman, who accompanied Commander Byrd on some of his Arctic explorations, on a trip over the 20,300-foot peak of Mt. McKinley in a plane equipped with skis for landing. They went to take moving pictures atop the snow-covered mountain.

Service Needed as Much as Airports

M. H. Kotzebue, Veteran Airman, Says Same Evolution That Transformed Gasoline Stations Will Change Airports Too

By Thomas F. Smiley

More airports and better service are needed by the petroleum and allied industries which are rapidly adopting air travel in the transaction of their business, according to M. H. Kotzebue, general superintendent of the Tulsa Boiler & Machinery Co., Tulsa. An airport must have housing facilities, a stock of supplies and skilled mechanics, this veteran airman asserts.

Like many another man who now operates an airplane in his business, Mr. Kotzebue received his air training in the World War, and later was an instructor at Ellington Field, Houston, Tex., in cross-country and formation flying. He was promoted to the grade of captain when the war ended. Following the war he had charge of the 360th Observation squadron (R.O.T.C.) and thus did summer flying. Besides this he frequently served as pilot for owners of ships who could not operate them. He assumed his present position six years ago and in 1926 he bought a small plane. Last July he sold it and the company bought a ship accommodating two passengers besides the pilot.

"We have found," said Mr. Kotzebue, "that it costs less to maintain the plane and an automobile than it formerly did to maintain an automobile alone."

"You use your motor car for the short trips and your ship for the long ones?" was asked.

"No," was Mr. Kotzebue's answer. "Distance isn't the determining factor. The nearness of an airport to the point of destination is. The character of an airport makes a big difference too. In some cases thousands of dollars have been spent in constructing an airport of impressive exterior that can't compare in practical value with some unpretentious port that has been fixed up at relatively small expense. What makes the difference? Service.

Things the Aviator Needs

"When an aviator makes a stop he wants a place to get warm, a place to get a warm meal. He wants plenty of supplies, including gasoline and oil of the right quality and consistency. He wants a mechanic who knows his business and can make a quick, thorough checkup of the ship and make any repairs required. A fine hangar and a smoothly graded field are excellent things, but they don't make an airport. Our airports will have to undergo much the same sort of evolution that has marked the gasoline service station."

Mr. Kotzebue referred to the time, not so many years ago, when a roadside gasoline pump and an ordinary machinist without automobile training, or perhaps a blacksmith, provided about all there was in the way of service for a traveling motorist. The car owner was pretty much his own mechanician. He often bought his grease and oil, carried them in his car if he was going on a long trip and applied them himself when he decided they were needed. He changed his own tires and he depended upon his trusty hand-pump for air. Overalls and jumper formed a part of his motoring outfit so that he could crawl beneath the machine at the roadside and, lying on his back, try to find out why the blamed thing made queer noises and seemed suddenly to have acquired locomotor ataxia.

One convenience after another was accorded the motorist as time went on until today he cannot go many miles on any improved highway without finding an inviting, comfortably appointed service station where courteous, specially trained attendants not only fill his tank with high-grade gasoline, but see that his radiator is filled with clear water, check his tires and inflate them if they need it, examine his oil supply and wipe off his windshield. Greasing service is there if he wants it. Rest rooms with toilet facilities are provided.

No Convenience Overlooked

Repair shops with modern appliances, manned by mechanics of special training in automobile work, are at convenient locations. Signs along the road tell the motorist what telephone number to call if unfortunately he needs the wrecker. Commodious auto hotels are found in almost all cities. Here the patron may have his car washed and greased while it is left overnight. Each of these purveyors to the motorist strives to outdo competitors in the matter of service. So high a degree of excellence has this service attained from its crude beginnings that it no longer is a matter of comment for a woman without the slightest knowledge of the mechanism of her car to take long journeys in it alone.

"Airports are simply service stations for the aviator," Mr. Kotzebue said. "As aviation advances and as more men and business concerns take up this mode of transportation, the more attention of course will be paid to airports and the service provided by them. There is not so much need today for more airports as there is for efficient, adequate service at those now in existence. That improvement is bound to come just as it came for the motorist as the use of automobiles increased."

"I look upon the airplane simply as a substitute for the automobile in certain circumstances," said Mr. Kotzebue. "I have no illusions about the matter. There are cases where the automobile or the railroad train will serve a purpose better than an airplane. These cases usually are where a long bus or taxicab ride must be taken after the aviator has arrived at the landing field. But the airplane offers such clear and important advantages in such a large percentage of cases that its wider and wider adoption in the oil industry and other lines of business is inevitable. It is no harder to learn to operate an airplane than it is to learn to drive an automobile. Every-day operation of the airplane is actually easier than driving a motor car after one has mastered the difficulties that always bother the beginner and his machine, whether it be a bicycle, a sailboat or a patent can opener. And there is not as much danger in flying as there is in fast driving of a motor car.

"The uses to which an airplane can be put profitably by an oil company or by a company manufacturing supplies for the oil industry are numerous. Our company installs natural gasoline plants and refinery equipment. Suppose the board of directors of a refining company in a town 100 or so miles distant is in consultation over a contract for some important equipment. The directors are not clear about

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Richfield Oil Co. aviation beacon and service station for motorists or aviators, near San Diego, Calif.

RYAN BROUGHAM OWNED BY TEXAS PACIFIC COAL & OIL COMPANY

The Texas Pacific Coal & Oil Co., the maker of —TP— Aero Motor Lubricating Oil, is said to have been the first concern to send out oil salesmen by airplane. Although this mode of traveling is a comparatively new development, it is spreading fast and at this time there are many other companies following this new method of salesmanship.

In addition to this increasingly popular use of airplanes by oil companies quite a number are employed in the transportation of officials on regular inspection trips.

The —TP— plane has traveled 29,000 miles without an accident. The ship is used exclusively by the sales department. It is in charge of George B. Fredell, manager of —TP— Aero oil sales division, and is piloted by the —TP— chief pilot, L. H. Atkinson. During the 29,000 miles of travel the ship has visited practically every major airport in the United States.

WE SELL

Naturaline advertising is appearing in Aero Digest, Aviation, Air Transportation, Popular Aviation. Through these consumer magazines a great army of pilots, owners and fliers are being convinced of the value of Naturaline. This breaks down resistance for you and helps to make sales.

NATURALINE *for* YOU

Naturaline has been well sold ‘ ‘ is being further sold to the pilots of the country. For two years its virtues have been persistently advanced through our advertising and personal contact. 495,000 people will read Naturaline advertising this year, and besides this the *"Plane Naturaline"* (a new Buhl Air Sedan) flies constantly from North to South ‘ ‘ from East to West ‘ ‘ mingling with the leaders of Aviation and proving the worth of Naturaline.

A Naturaline franchise taken by you now will place you in the enviable position of distributing the super-aviation fuel, and one that by sheer merit and achievement is destined to remain a favorite. Aviation is opportunity knocking ‘ ‘ Naturaline is the fuel with which to meet it. *Write for further information.*

NATURALINE
THE SUPER AVIATION MOTOR FUEL

NATURALINE COMPANY
OF AMERICA
Chestnut & Smith Bldg. Tulsa, Oklahoma

West Texas Producers Rely on Plane

Long, Rough Rides Between Oil Fields and Company Headquarters Obviated by Use of Air Travel

By James H. Dameron

FORT WORTH, Tex., Jan. 21.—Oil producers in West Texas probably rely upon the plane as a means of rapid transportation more than those in any other territory, mainly because of the distance between the fields and the headquarters of most companies.

It is an overnight ride by rail from Fort Worth to most points in West Texas and a long day of fast driving in a car. From Houston or Tulsa the traveling time is virtually doubled. But in a plane it is a matter of a few hours.

As a swift means of transportation more than a score of Fort Worth producing companies and independent producers are using planes and most of them own their own ships. Parties of executives making tours of inspection have shortened their time in the fields of West Texas many days through the speed at which they can cover such a vast country.

The Midland Oil Co. affords an example of the use Fort Worth companies make of planes. That company owns two ships and both W. A. Hudson, president, and H. S. Jones, secretary-treasurer, are pilots. Their holdings are scattered from the Ranger district, through West Texas and into Mexico and frequent trips to some of the leases are necessary.

A lease in the Blake Pool of the Ranger district is often visited by one of the two executives. To reach the leases by driving in a car requires approximately four hours. To go and return consumes a full day and in many instances a day and a half. It takes 1 hour and 10 minutes to fly to the lease from the Fort Worth airport. Ships are landed on a field adjacent to the leases and are taxied to the lease. Only half a day ordinarily is needed for the whole trip. This company is fortunate in having several leases that are adjacent to good fields for landing.

Plane Provided New Outlook

On a recent flight to properties in Mexico, Midland company officials gained an entirely new outlook on some of their properties after viewing them from the air. Incidentally some of the most isolated mining districts in Mexico, heretofore undeveloped because of their inaccessibility, may be developed if plans for transportation of ore and material by air are put into effect.

On the return trip the Midland ship made the flight to Fort Worth in 7 hours and 10 minutes. Going from Mexico City to Tampico, a 30-hour train ride over the mountains, the ship made the 210-mile flight in 1 hour and 15 minutes. In crossing the mountains it was necessary to climb to an altitude of 13,000 feet.

Trips in New Mexico and into the Panhandle are frequently made and when a "hot" lease play develops in some section it is common for several companies to send their lease buyers into the area within a few hours by air.

The initial cost of planes is of course much more than the initial cost of automobiles. However, their operation is figured to be as economical as the operation of an automobile. Pilots usually get around 200 hours out of a motor before repairs are necessary. Those same motors have a cruising speed of around 100 miles per hour which would give a motor 20,000 air miles before repairs are necessary. Approximately 12 gallons of gasoline is consumed every hour and 4 gallons of oil every 10 hours. Unlike the automobile the plane has virtually no wear on the body and no need of new tires every 10,000 or 15,000 miles.

Getting Airport Sites

West Texas towns and cities that do not have airports are authorizing the purchase of desirable sites. All of the principal cities in North and West Texas such as Wichita Falls, Amarillo, Midland, El Paso, San Antonio, Ranger, Abeline, San Angelo and Midland, have first-class airports.

Because of the sandy condition existing in Winkler County a plane cannot be landed near the Hendricks Pool. However, a landing field may be made there if demanded. It is pointed out by authorities that the sand can be packed with the waste fluid from the pool.

The municipal airport at Fort Worth is one of the best in the Southwest and the Texas Air Transport Co. is expanding its service better to serve the oil industry. In addition to having several mail contracts the company is the southwest agent for a number of planes, conducts a school of instruction for pilots, maintains an air taxi service, is enlarging its machine shops and will soon have a department equipped for aerial photography.

Its air taxi service is frequently engaged by supply companies. Every now and then there is an urgent call for a piece of equipment for a well. Searches through field warehouses show that piece of equipment out of stock but available at a distant warehouse. A taxi service plane can get the equipment to the well with the minimum of delay.

Catch Trains by Air

This same service is used extensively by producers and royalty buyers who do not own ships. Frequently executives desiring to leave on afternoon trains for eastern points are delayed an hour or more after their trains have departed and they use the plane to catch that train at some other station.

In West Texas pipe line companies employed aerial photography in the selection of routes for the first time in 1928. Many companies express the belief aerial photography will be used in the selection of routes for future trunk systems.

Speed has always been the dominating factor in the construction of trunk lines and determination of the most desirable route is greatly aided by the use of a plane. The use of aircraft in the selection of routes for transmission lines has been confined mostly to reconnaissance surveys although some aerial photography has been applied.

In some of the mountainous country of West Texas aerial photographs have played an important part in the rapid finding of the most direct route for a line. In one instance aerial photography was employed after the field crew had made a tentative route through a rough stretch of country. The photographs revealed a more desirable route with fewer bends and curves.

Reconnaissance Cost Low

Besides aiding in finding the most advantageous route the photographs show the topography in relief, giving the engineers a better picture of the problems and requirements. The cost of the reconnaissance flights in proportion to the cost of the project is very low. Photographic work is more expensive, its cost ranging from $15 to $35 per square mile of country photographed. The cost range depends upon several factors.

Aerial photography for geological purposes in West Texas has been limited but in the coastal region and in more broken country it has offered distinct advantages to geologists. Instead of aerial photography the geologist in West Texas has used the plane for reconnaissance surveys with satisfactory results.

The Texas Pacific Coal & Oil Co. of Fort Worth has pioneered in using its plane strictly for its sales department. It has covered close to 26,000 miles of territory with satisfactory results.

The company several months ago brought out a special lubricating oil with a low cold test for airplane motors. To market the product the sales department decided to purchase a plane to transport their salesman to airports instead of having him drive there in a taxicab. The plane also was to be used in testing the oil during the flights.

V. N. Johns, a mechanic, is pilot and George B. Fredell, also a pilot, is the salesman. Each day they make a flight, their flight is plotted on a large map of the United States which is already webbed and dotted with red string looped around pins placed in the map at cities visited.

Test Oils as They Fly

Mr. Fredell sells only two products, the lubricating oil and oil for rocker arms in the motors. All the time tests are being made of the oils and both the salesman and pilot are in a position to talk informatively at the various airports they visit. The company expresses itself as well satisfied with the tangible result and with the good will created. Plans have been made to keep the salesman "in the air."

Local aviation concerns are finding

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OIL INDUSTRY EARLY FRIEND OF AVIATION

Since its infancy aviation found one of its staunchest supporters in the oil industry. During the days of the barnstormer pilots frequently had their ships fueled gratis by oil companies at points where the pilot landed his ship. Usually that company offered an automobile to the pilot for his use during the stay. In return the pilot advertised the trade-marked product of the oil company from the air to a craning-necked and open-mouthed public below.

Both aviation and the oil industry have made remarkable progress since then and each continues to be of benefit to the other. As a rapid mode of transportation the industry recognized the value of the plane long ago. Numerous oil companies now own and operate ships of their own.

Oblique views of Yates Pool in Pecos County.

KEEPS LOG FOR GOVERNMENT WHILE CONDUCTING FLYING SALES OFFICE

The flying sales office of the Naturaline Co. of America, Tulsa, with its compact equipment for performing business tasks while winging about in the sky, represents an advanced point in commercial use of the airplane. The company, organized by the Chestnut & Smith Corp., Tulsa, and affiliated companies, employes the ship in establishing a distribution system for Naturaline, a processed natural gasoline designed for aviation purposes.

Under the front passenger seat of the ship, a Buhl Airsedan, is a folding typewriter table, with typewriter attached. Conveniently at hand are a letter file for correspondence, a card index and a stationery cabinet. The ship has had 325 hours in the air in 14 weeks and flown about 27,000 (ground) miles, or more than the distance around the earth. It has been as far north as Toronto, Canada, and as far south as Miami, Fla. It has gone from Boston to Los Angeles. This airplane is believed to cover more territory than any other commercial plane used for business purposes.

The Naturaline company's plane is of the sesqui or modified biplane type, the lower wings having approximately half the area of the upper wings. It seats four passengers in addition to the pilot. Fred L. Foster, head of the company's aviation division, who with his pilot, Ralph Montee, travels about in the ship, says distances are covered with about three times the speed that would be possible if crack railroad trains were used instead, and that the cost is no greater, saving of time taken into account.

Plane of Supreme Value

When an important contract is to be closed quickly the plane becomes of supreme value, enabling Mr. Foster to be on the ground in a short time, even though hundreds of miles must be traversed. He deals with the independent jobbers throughout the country, building up through them a system of distributing his company's product.

Another respect in which this ship is unique is that it is the only one devoted to sales purposes equipped with instruments provided by the United States Bureau of Standards for making an air log covering a wide range of data of great value to the bureau. This plane was selected for recording information desired by the bureau because it encounters all kinds of weather conditions in various parts of the United States and Canada and because it uses many kinds of aviation gasoline and lubricating oil. Through the log maintained by the ship "Naturaline" the bureau obtains aid of distinct value in its investigation of the characteristics of flying conditions.

Present government aviation fuel specifications were set up during the World War at a time when the Allies were demanding all of the high-test aviation gasoline it was possible for this country to furnish for use in the higher compression European motors. This high-test fuel was identified as "Fighting Grade Aviation." At the same time a specification designated as "Domestic Grade Aviation" was set up for gasoline to be used in wartime motors of the United States. This gasoline was a heavier, less volatile fuel than that specified as "Fighting Grade."

More Volatile Fuel Needed

Since the war the "Fighting Grade" has been eliminated, and gasolines purchased for government use come within the "Domestic Grade" specifications. As a result of this the development of higher compression motors has been somewhat retarded owing to the fact that the domestic aviation gasoline will not function properly in the modern type of aviation motor, and the oil industry is endeavoring to build a fuel of a higher grade to meet the demands of the modern type of motor, which requires a much more volatile fuel and one having more pronounced antiknock properties than exist in "Domestic Aviation Grade."

Co-operating with the Government and using the instruments provided by the Bureau of Standards, the "Naturaline" fliers make readings every 30 minutes on all flights and these readings are incorporated in reports made to the bureau. The readings show weather conditions, humidity, barometer, altitude, air temperature, revolutions of the motor per minute, oil pressure from supply tanks to bearings, oil temperature, air speed, air miles, gasoline consumption, total oil consumption, temperature of gasoline in the tanks and at the carburetor. The log shows also conditions of the air, whether smooth or rough, the velocity and direction of the wind at various altitudes. It notes such conditions as fog, snow, sleet, rain or clear weather. Wherever he may be Mr. Foster sends these logs promptly to the Bureau of Standards, which analyzes them for the benefit of its own investigations.

In his flights about the country, Mr. Foster frequently has the two supply tanks of the ship filled with different brands of gasoline. Like other salesmen of aviation fuel who travel by air, Mr. Foster has the immeasurable advantage of being able to talk the language of the airman understandingly. Although he does not now handle the controls himself, Mr. Foster is a licensed pilot.

PUTTING WINGS ON GEOLOGIST'S MULE

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tention of an oil producing company, with the element of competition to be considered, and the prospect of a hot campaign of offset leasing in view, it is possible to rush a few well-chosen aerial pictures to the geological department, the members of which, with their general knowledge of the country, may be enabled to make a very fair preliminary judgment as to which parts of the area may be most desirable from a leasing standpoint. Speed always has been one of the most important features of aerial photographic work, and at no time is it more appreciated than under conditions similar to these.

Another feature of photographic information is that data can be compiled at a cost proportionate to the development of the project. During the first exploration of an area, a suitable set of uncorrected contact prints will reveal enough data for most preliminary studies, both in the office and in the field. Subsequently, if the area proves a productive oil field, a precise map may be made from these same prints and furnish the basis for extensive and thorough geological surveys, and the fundamental map data for the engineering, pipe line and right of way departments.

Experience has shown that these aerial pictures are of great assistance to the chief geologist as a means of directing office conferences concerning the area. The field men can point out the exact points in the area where they have been and report any experiences they have had there. They can tell a more complete story in fewer words than any amount of long-winded description could possibly convey.

Often Eliminates Need of Contour Map

Not the least valuable of the aerial camera's advantages to the geologist is the peculiar ability it has for eliminating the necessity for contour maps. In most cases they can be eliminated because the aerial photographs under the stereoscope reveal so much of the general topography that the only task remaining consists of taking cross sections, to determine thickness of beds and so forth. In many instances this release of the topographical parties which ordinarily must accompany the geological parties has more than saved the cost of the aerial pictures. One recent instance which comes to mind is that of a western area of approximately 400 square miles, where three plane-table parties which had been costing the company more than $1,000 a month each were dispensed with by this means. This saving alone, over the period

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in which the geology was being studied, paid for the aerial map with a comfortable margin besides.

The chief geologist benefits greatly from the study of the pictures in his office, but the man in the field benefits even more by his ability to study the area before actually going into it. No longer is it necessary for him to scramble through dense underbrush or climb laboriously to the top of a hill to locate himself by Brunton compass. The geologist who has his kit of prints with him in the field merely checks his position with known features; with reference to this or that trail, or rock, or tree, or bend in the stream. His location is instantaneous. He puts a dot on the picture and assigns it a number; then he records his observations under that number. Sometimes he even dispenses with the field book and makes his record directly on the picture.

Did It in One-Fifth the Time, Too

Here is one illustration of what happens under actual field conditions where a set of aerial pictures is used. Not long ago two geologists were working in the same area. They represented competing companies, one of which had the advantage of a preliminary aerial survey. This company's man finished his work in two weeks and departed, while the other required 10 weeks to complete the same job. Neither found anything of any geological significance from the oil standpoint and later they compared notes. They discovered that he who had used the aerial pictures not only did the work in one-fifth the time, but had found many important features which were hidden from the other man.

It is a great advantage to the field geologist to take out his portable stereoscope from a small leather case fastened to his belt, and view the country he is occupying in three dimensions. He holds the pictures in front of him or lays them on the ground and examines them in much the same manner as our grandfathers examined double tintypes of Niagara Falls in their mid-Victorian parlors. This process enables him to see what is around the next bend, or over the next hill without the labor of going there in person. He often is able to determine how far the bedding he is tracing extends into the next watershed or beyond, and thus save the time he otherwise would have to spend tracing it on the ground. He follows them all on the ground for confirmation, but he does not follow a false clue. He knows in advance what to expect.

Quite often the strike of a formation is indicated clearly on the picture, as in illustration No. 3, requiring no further field work. The edge of the bed shows distinctly, and the geologist determines the dip by the usual method; whereupon he packs up his kit and goes home.

Two Points of View

The wide use of aerial pictures by geologists is developing different schools of thought, or groups, each of which uses the aerial information in a different way. Of course circumstances often dictate how much information is necessary, but the different ways of securing it are worth recording. There are those who feel that the precise accuracy of a finished map is unnecessary and not justified. They use a rough mosaic, made up of a set of prints assembled to nearly correct visualization. In other words, it "looks right," and they can see all the features they need, so the extra effort of corrections in scale are not needed. A map of this kind may carry errors in scale all the way from nothing to 12 or 15 per cent in the case of rough country. It is reasoned, however, that even though the map may be somewhat distorted from absolute plan, the distortion is probably not abrupt and the general relationship of the various features is close enough for the purposes in hand.

There is also a faction composed of geologists who use the individual pictures without any mosaic, or map, being assembled. In order to accomplish this, some sort of ground network, either triangulation or section corners, is established and transferred to a tracing. These known ground points are plotted on the aerial field sheets as the geologist proceeds with his work, at the conclusion of which the data is transferred from the field sheets to a tracing as carefully as possible. The map which emerges from this process is exactly like the ones the geologist is in the habit of using. However, this group is in the minority, most of the profession taking the view that the geological map should be superimposed over a photographic one.

This is the map which is now being used so widely to assemble and classify geological data. A precise map is made, onto which the field data is transcribed from the field sheets. The result is a map which shows all features in their direct relationship, and is the surest way, and in certain types of country the most economical way to be sure the geological map is absolutely right.

Expert Service Important

Geologists require quite an extensive service from an aerial map organization. Speed of service is perhaps the foremost, which of course includes responsibility of organization, and the knowledge that the information is confidential. Photographic equipment and quality must be of the finest, so that every slight difference in shading and appearance of the ground will appear to its best advantage. Skilful piloting of the airplane is of the utmost importance because it assures a systematic covering of the ground in straight lines and uniformity of scale, which is vitally necessary. For the same reason, skillful handling of the camera is likewise of the greatest importance, because it assures pictures free from excessive errors and guarantees a uniformity of overlap. In addition a complete knowledge of the mathematics of aerial engineering is required, as well as an understanding of the meaning of the errors and the ways to correct them. The accuracy of the photographic technique. Errors in color between different pictures may readily be interpreted as ground features which do not exist. Quality work under high pressure and at high speed can only be secured by a thoroughly trained organization with complete equipment in material as well as personnel.

It has been found impossible to pick men at random from other lines of work and develop them into aerial mappers. The average young engineer or commercial photographer cannot, except by careful training and long experience, qualify in so specialized a profession. It has a technique as complex and as difficult to acquire as that of the geologist himself. This work cannot be accomplished except by a properly trained and equipped organization.

To summarize, if there is any surface indication of features which interest the geologist, he will be able to see them much better and be more certain of his results if he has an aerial map to aid him. If, on the other hand, the country is of such a nature and formation that the only means of securing information is by the use of the torsion balance, seismograph, or other delicate geological instruments, then the aerial map's uses will be less extensive. In territory such as West Texas, buried under a deep alluvial deposit, where geologists agree that the surface indications are of practically little value, a surprising amount of information may nevertheless be gained by their use. But where the evidence can be plainly seen, the aerial camera can get it, and bring it in faster, more cheaply and more thoroughly than with the old-time methods.

WEST TEXAS PRODUCERS RELY ON AIRPLANE

(Continued from Page 84)

other industries are taking some of their salesmen off the road and putting them in the air. This method of sending men from the marketing division has been gaining in favor steadily, according to airport officials.

The Texas Pacific company's ship has been in the air 270 hours and has flown 25,843 miles. The ship's course has taken it to 250 airports scattered over the United States and only five forced landings have been made. Four of these were due to rain or fog and the other was because of a slight mechanical difficulty that required 20 minutes to adjust. The engine time totals 305 hours and a recent checkup revealed it to be in excellent condition.

The ship has been in service 190 days and has had 105 flying days. A day is called a flying day whenever the ship leaves the ground. The ship has not been kept on the ground more than 10 days by weather when it was scheduled to be flown to another port. Employes or executives of the company are [illegible] taken up for diversion or inspection flights. Marketers, however, are given courtesy trips at the various ports of call.

THESE MEN WATCHED THE SUCCESSFUL FIRST FLIGHT

Officials of the Butler Manufacturing Co., Kansas City and Minneapolis, were snapped in front of their airplane just after it landed from its successful first flight. Left to right: V. C. Norquist, plant engineer; E. E. Norquist, president and general manager; Howard Jones, test pilot, is on a wing; Waverly Stearman, airplane designer; William A. Knapp, vice president; John G. Fahlstrom, Kansas City plant superintendent; William C. Glover, manager Glover sales division; Roy S. Kemp, vice president and credit manager. Other officials of the company not shown are F. A. Rufi, secretary; Oscar D. Nelson, treasurer; C. C. Crouch, vice president and manager Minneapolis division, and John Nelson, Minneapolis plant superintendent.

QUALITY OF FUEL IS SUPREMELY IMPORTANT

(Continued from Page 75)

fuels such as the last one in the above table are preferred, for such volatile fuels weigh about one-half a pound less per gallon and give equal mileage or flight duration as a gallon of heavier, less volatile fuel.

Three Ways of Decreasing Weight

So far as the motor itself is concerned there are essentially only three ways of decreasing the weight per horsepower:

Increase the speed of the motor.

Build a lighter motor by removing all unnecessary metal and increase the compression ratio.

Increasing the speed of the motor decreases the number of light hours before a general overhaul is necessary. Decreasing the metal contained in the motor is apt to weaken it and particularly to cause loss in rigidity. This leads to increased vibration and more rapid wear of the motor, even though no strength has been lost. Increase in the compression ratio not only increases the power output of the motor, but also decreases its fuel consumption, without having any harmful effect on the reliability and durability of the motor provided only that fuels can be obtained which do not knock at the higher compression ratios.

Careful consideration will lead to the obvious conclusion that the increase in the compression ratio is the only satisfactory means of improving power plant efficiency in commercial aviation. Special motors of compression ratios of about eight to one, weighing slightly less than 1 pound per horsepower, have been built and operated, but all motors used in commercial aviation and on the long non-stop flights are relatively slow speed, that is, well under 2,000 revolutions per minute, and weigh about 3 to 5 pounds or more per horsepower. The slow speed and heavier construction make for greater durability and less frequent overhaul. An increase in compression ratio, however, would improve the efficiency in power output of these heavier slow-speed motors without any appreciable loss in durability.

More Power From High Compression

The use of higher compressions would therefore result in a net over-all increase in power and economy which are greatly to be desired in commercial aviation and absolutely necessary for the special, high-powered, high-speed planes used by the Army and Navy. The following tabulation will indicate the increase in power obtained by simply increasing the compression ratio of a motor. This tabulation is based on a motor of five-to-one compression ratio, of 100 horsepower.

Compression ratio	Power output
5	100
6	106
7	111.5
8	115.5
9	119
10	122
11	124.5
12	126.5
13	128.3
14	130

These results are based on actual motor tests at compression ratios from 3 to 13.75 on a Universal test engine (developed by the National Advisory Committee at Langley Field) installed in the research laboratories of the University of Michigan, and agree very closely with those reported by Ricardo up to compression ratios of 7.75 to 1. The motor used by Ricardo was not built to operate at compression ratios higher than 7.5 to 1, so no comparison can be made at the high compression ratios.

Compression Ratio Varies

The ordinary run of domestic aviation gasoline which is now available throughout the country will not operate the average motor satisfactorily at a higher compression than about 5.25 to 1. Some motors using more efficient combustion chambers may be able to operate as high as 5.7 or possibly 6 to 1 on this regular

LOCKHEED

THE TEXAS COMPANY, *New York, operate "Texaco No. 2," a Whirlwind-Vega, in the sales and advertising of their well-known "Texaco" petroleum products. Frank Hawkes, Chief Pilot.*

STANDARD OIL COMPANY OF NEW JERSEY *use Lockheed Wasp-Vega for transportation of officials and inspection of holdings. The familiar Standard Oil color combination is carried out.*

ERLE P. HALLIBURTON'S *Wasp-Vega. An oil field service plane which won by a margin of over three hours the Class "C" Transcontinental National Air Race Event. "Bob" Cantwell. Pilot.*

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Wasp-Vega

The fastest five-place commercial airplane in the world. Performance comparable to that of the fastest single-seater pursuit planes. The choice of those who require maximum high speed without sacrifice of comfort or safety. Holder of Los Angeles to New York, and New York to Los Angeles non-stop flight records. Many times a winner in National Air Race events. Action of ship in flight shows unusual inherent stability. Permanent alignment, perfectly stream-lined, and head resistance less than one-half that of conventional types.

Top Speed* - - - - - - - - - *170 miles per hour
Cruising Speed* - - - - - - - - *135 miles per hour

Whirlwind-Vega

Luxuriously appointed cabin monoplane with comfortable accommodations for four passengers, baggage and pilot. The same sturdy plane (with refinements) that carried Captain Wilkins across the top of the world. Vibration and noise eliminated to a remarkable degree by monocoque fuselage construction. A favorite with operators, pilots and passengers. Performance with 220 h. p. Whirlwind engine equals that of many planes using approximately twice the horse power.

Top Speed* - - - - - - - - - *138 miles per hour
Cruising Speed* - - - - - - - - *118 miles per hour

Wasp-Air Express

A seven-place monoplane with 1,500 pound pay-load. Designed and built to meet the most exacting requirements of mail, passenger and express service. Folding seats allow all or part of six passenger cabin to be instantly converted into cargo space. Performance is approximately the same as that given for the Wasp-Vega.

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domestic aviation fuel. The use of Ethyl gasoline, or some of the extremely volatile aviation fuels now on the market will enable the designer to use compression ratios of about 0.8 or 0.5 of a ratio higher, respectively. Special fuels of extremely high knock ratings, as produced by special cracking processes, or even higher ratios as compared to 5.3 can be used at compression ratios of about 6.7 to 7.0 for regular domestic aviation. We have recently tested one such fuel which could be operated satisfactorily at a compression ratio of 11 to 1. For higher compression ratios, it is necessary to use benzol, toluene or other aromatic compounds.

The quality of an aviation fuel depends largely upon its volatility and knock rating. Recent developments in the motor fuel industry have forced most marketers to recognize the importance of these two qualities in motor fuels. But where simply desirable in motor fuels these qualities may become absolute necessities in aviation fuels, for the reasons enumerated above.

In marketing aviation fuel, success comes only to those selling a superior product possessing high total volatility as indicated by a low 90 per cent point on the A.S.T.M. distillation, combined with a relatively low vapor pressure, and high knock rating. The marketer can judge the volatility himself from the 90 per cent point and 10 per cent point as has been suggested, and there are numerous reliable laboratories throughout the country which can give a satisfactory report on the knock rating of a fuel. These points should be carefully considered before attempting to market aviation fuels, as 50 gallons of poor fuel sold to some pilot will immediately brand that marketer as unreliable, and reliability in motors and fuels are absolutely essential for successful aviation.

SERVICE NEEDED AS MUCH AS AIRPORTS

(Continued from Page 81)

certain provisions of the contract, we'll say. They telephone me and I make the trip by air in such a short time (proper airport facilities assumed, of course) that I can join them before they need to adjourn their conference, give them the information they want and soon be back in my own office again. The thing couldn't have been straightened out by telephone. A trip by automobile or railroad would have involved delay and perhaps another meeting of the directors.

Plane Leaves Rest Behind

"I know cases where a company wanted bids on equipment. A man with a plane flew to the company's office, made a bid for his own concern, received the contract and was back home before competitors using automobiles had reached the office of the company desiring the equipment. I can make the trip from Tulsa to Bartlesville, a distance of 60 miles, in 45 minutes with favorable winds, counting the entire time from the moment I leave our office till I reach the center of Bartlesville's business district. It takes about an hour and a half by automobile. I flew to Arkansas City, Kans., recently in an hour. The same trip by train or automobile used to take two nights and a day."

J. E. Carnahan, the elderly president of the Tulsa Boiler and Machinery Co., has become an enthusiastic air passenger and never misses an opportunity to ride in the company plane.

Reverting to war days, when the military aviator was regarded with something like awe, Mr. Kotzebue laughed as he recalled an incident illustrating feminine admiration for the army flier. A formation of 10 ships flew from Ellington Field to Katy, Tex. Hundreds of residents of the Katy district pressed around, looking and speaking their enthusiastic interest. As the airmen were about to hop off for the flight back to the field, Lieutenant (Shorty) Walton, who had been explaining his ship to a pretty girl, said banteringly, "If it weren't for the crowd I'd kiss you goodbye." The girl looked up at him with an encouraging smile and replied, "Why, there aren't so many." The lieutenant rose to the occasion.

OIL MEN INTERESTED IN PLANS TO IMPROVE AIR LINES OF SOUTHWEST

Oil operators are much interested in steps about to be taken to cover the Southwest and the lower Mississippi Valley with a network of air mail and passenger lines. Bids are to be received by the Government for a new line from Louisville to Dallas by way of Nashville, Memphis and Little Rock, connecting with the Texas air lines and the International mail route on the south and the Louisville-Cleveland route on the north, and also forming a junction with the proposed Chicago-Louisville-Birmingham route.

This will be followed by action to run a line from the New Orleans and San Antonio routes south from Houston to Brownsville, linking with another branch of the Mexican air mail, which has been under consideration.

The third great step which appears near is the one which has been urged by Lieutenant Van Zandt, who has been in Washington recently asking for a route from El Paso to Dallas and from El Paso across New Mexico and Arizona to Los Angeles.

These changes will necessitate some changes in schedules in order efficiently to link up all the lines into one system. It will also cause a change in the schedule of mail to and from Mexico. The American Government is anxious to get the Coastal route from Tampico to Houston and New Orleans via Brownsville in operation to save several hours on the transmission of commercial mail between the important ports.

Under Handicap Now

This is handicapped at present by the necessity of serving San Antonio through Laredo and by political considerations on the Mexican side, which prevent the changing of the crossing point, making another line appear necessary.

These lines in the South will speed the mails from the Southwest to New York, New England, Canada and to the Northwest.

Three Important Routes

When the Dallas-Louisville line is put into operation there will be three important routes connecting the Southwest with New York, which, with their numerous connections with other routes, will make it almost impossible for weather conditions in any locality to prevent the rapid delivery of mail.

The idea of W. Irving Clover and other postal authorities is to provide a complete network which will give the cities of the South and Southwest service by air comparable in its timing and efficiency with that by rail.

These projects are those which are being given the most serious consideration. The Louisville-Dallas route is in slight, the New Orleans-Brownsville project is being pushed as rapidly as international postal conference can be pushed and the El Paso-Dallas link may be expected to take form about the end of this year. This route and its companion, the one to Los Angeles, are being delayed by the incomplete data on the volume of business that may be expected to be carried over it in the immediate future.

Other Routes Considered

In addition to these, several others are getting consideration. One of these is from El Paso to Cheyenne and Denver, another is from Birmingham through Shreveport to Dallas.

The El Paso-Cheyenne would link the two transcontinental lines and provide another short cut in case of bad weather on either of them. It also would link sections having similar interests and would save several hours in the flight from either of the northern cities to Texas and Louisiana business centers.

The route from Birmingham to Dallas would serve the oil and steel industries and the cotton industry and would provide another safety valve for mail to the North and East. It would connect direct with the following routes: Dallas-Houston; Dallas-San Antonio; Dallas-El Paso; Dallas-Chicago; Dallas-Louisville and Cleveland; Shreveport-New Orleans; Birmingham-Atlanta and New York; Birmingham-Atlanta and Cuba; Birmingham-Mobile; and Birmingham-Chicago.

STANDARD OF INDIANA DECIDES TO BUY NEW TRI-MOTORED MONOPLANE

The purchase by Standard Oil Co. of Indiana of a new 12-passenger Ford trimotored monoplane opens a new chapter in aviation activities of large corporations. The new plane will be powered by three Pratt & Whitney Wasp 425-horsepower engines, or a total of 1,275 horsepower. It will replace Indiana's present plane, the Stanolind, a 10-passenger unit with 600 horsepower, which will be sold.

The use of the Stanolind has demonstrated the practicability of the airplane as a means of fast, safe and comfortable transportation for executives. Its maiden trip was from the Ford airport at Dearborn, Mich., to Chicago, on May 21, 1927, the day Lindbergh completed his transcontinental flight at Le Bourget Field, Paris.

Since then, Standard of Indiana directors have flown more than 84,000 miles. The trips included Chicago to Denver, in 11 hours and 35 minutes; Chicago to Detroit, 2 hours and 5 minutes; Chicago to St. Louis to Kansas City to North Platte to Casper, Wyo., 12 hours and 20 minutes, and Casper, Wyo., to Chicago, 9 hours and 50 minutes. Other trips have been taken with the same speed and comfort, not to mention time saved and resultant saving in executives' salaries.

Used for Inspection Trip

"As an illustration," says the Stanolind Record, organ of Standard Oil Co. of Indiana, "directors recently completed a trip of 2,900 miles in 33 hours' flying time, spread over four and one-half days, on an inspection tour of the Texas oil fields. To cover the same distance by trains would have taken 10 days, without enabling directors to see as much or to obtain a picture as comprehensive as that afforded them from the air. That 50 per cent to 80 per cent of the directorate often flies at one time is a good indication of faith in this type of plane, when it is considered that these men control the destiny of stock which recently sold on the market for some $900,000,000."

Aside from supplying transportation to Indiana's executives, the Stanolind has served to emphasize the advantages of aviation throughout the 10 States where the company does business. It has been flown to hundreds of cities in the Middle West, taking up on short flights, without charge, Congressmen, Governors and other public officials, also prominent business men and civic leaders.

In this service, it has flown in the 16 months from May 21, 1927, to October 31, 1928, a total of 76,491 miles, and carried 5,988 passengers. It never had a forced landing due to mechanical trouble. On two occasions one of the three motors developed trouble, but flight continued on two remaining motors until a convenient landing place for repairs was reached.

Would Increase Use

Allan Jackson, vice president of Standard Oil Co. of Indiana, states: "We cannot speak too highly of the Wright whirlwind engines that have performed so faithfully on such a strenuous schedule as we have had."

The Stanolind, soon to be replaced by the new 12-passenger plane, is housed with the company's Laird biplane at the Municipal landing field, Chicago.

FEW ACCIDENTS OCCUR IN TRANSPORT FLYING

Neither military nor private flying is comparable to commercial air transport and the safety of the latter cannot be judged by accidents that occur in the other two, says Frederic L. Simmons of the National Bank of Commerce in New York, in the Commerce Monthly.

There are no better pilots than those in the Air Corps but military flying demands maneuvers, such as combat training and formation flying, which are of no use to transport flying. While there are some private flyers as proficient as those in transport or government service, there are many of them who have neither comparable equipment nor experience. The large majority of airplane crashes occur not in transport flying but in stunt or record seeking flights or in flights in unairworthy planes by inexperienced pilots. Out of 164 fatalities in 1927 only 7, or less than 5 per cent occurred in air transport.

On the basis of British figures, which are an average of seven years, one could fly the distance around the earth with the chances less than 1 to 40 of being killed.

SOME OF THE RECORDS AIRPLANES HAVE MADE

The Wright Brothers' pioneer airplane—it was called a flying machine in those days—went 120 feet in its maiden flight on that epochal day at Kitty Hawk, N. C., 25 years ago, but it was a record that meant more for the future of transportation than even Lindbergh's transatlantic flight. Here are some other airplane records:

Altitude—38,418 feet.

Duration record—65 hours and 25 minutes.

Duration record, refueling from air—150 hours, 40 minutes (record made by Question Mark).

Distance record (airline)—4,406 miles.

Maximum speed of airplane—278 miles per hour.

Nonstop flight from Pacific to Atlantic, 18 hours, 58 minutes.

Nonstop from Atlantic to Pacific, 24 hours, 51 minutes.

WOOLAROC GOES TO PHILLIPS

WICHITA, Kans., Jan. 21.—Arthur C. Goebel, noted flier, said the "Woolaroc" monoplane in which he won the Dole flight to Hawaii, would be restored to its original appearance and sent to the Frank Phillips ranch at Bartlesville, Okla., for display.

Mr. Phillips is owner of the plane and he provided the funds for its historic flight. He is president of the Phillips Petroleum Co., which makes an aviation gasoline.

The plane is to be stripped of its new 400-horsepower engine and other equipment installed for Goebel's proposed attempt to lower transcontinental flight speed records.

AIR MILEAGE SHOWS GROWTH

How the number of air lines throughout the world has increased since 1919 is indicated by the following table, which presents the total mileage of organized air routes for each of the 10 years:

1919	3,200
1920	9,700
1921	12,400
1922	16,000
1923	16,100
1924	21,200
1925	24,700
1926	56,300
1927	55,500
1928	72,300

ROCKY MOUNTAIN AREA

(Continued from Page 53)

natural gas from the Artesia Field for the first time this week when the Pecos Valley Gas Co. turned the gas into its new line.

New Rules

B. F. Pankey, commissioner of public lands for the State of New Mexico, has announced a change in rules and regulations relating to rentals, or bonus chargeable for oil and gas leases in certain areas beginning January 15, 1929. On and after that date the minimum charge for oil and gas leases for the first year's rental or bonus as fixed by the order shall apply in all instances where lands are offered for lease on sealed bids or at auction at the regular monthly lease sale; where existing leases are surrendered for the purpose of applying for and obtaining new leases on the same lands; where existing leases expire and lessee applies for a new lease in the exercise of a preferential right. Rentals after the first of the year shall remain at the rate of 50 cents an acre as prescribed by existing rules. The schedule announced was as follows:

"The minimum first year's rental shall be $5 per acre for all lands in the following described townships: Twp. 16s, Ranges 30 to 39e; Twp. 17s, Ranges 29 to 39e; Twp. 18s, Ranges 28 to 35e; Twp. 19s, Ranges 28 to 35e; Twp. 21s, Ranges 33 to 38e; Twp. 20s, Ranges 31 to 34e; Twp. 21s, Ranges 33 to 38e; Twp 22s, Ranges 33, 34 and 38e; Twp. 23s, Ranges 33 to 38e; Twp. 24s, Ranges 33 to 38e; Twp. 25s, Ranges 33, 34 and 35e; Twp. 26s, Ranges 33, 34 and 35e.

"The minimum first year's rental or bonus charge shall be $25 per acre for all lands in the following townships: Twp. 18s, Range 36e; Twp. 19s, Range 36e; Twp. 20s, Ranges 30 and 35e; Twp. 21s, Range 37e; Twp. 22s, Ranges 35, 36 and 37e.

"The minimum first year's rental or bonus charge shall be $50 per acre for all lands in the following townships: Twp. 18s, Ranges 37, 38 and 39e; Twp. 19s, Ranges 37 and 39e; Twp. 20s, Ranges 29, 36, 37, 38 and 39e; Twp. 21s, Ranges 34 and 36e; Twp. 25s, Ranges 36, 37 and 38e; Twp. 26s, Ranges 36 and 38e.

"The minimum rental shall be $75 for all lands in the following described townships: Twp. 19s, Range 38e; Twp. 26s, Range 35e; Twp. 26s, Range 37e.

"The minimum first year's rental or bonus charge shall be $1 per acre for all lands other than those hereinbefore described and lying within District 1, which embraces Townships 16 to 20s, Ranges 26 to 39e, and Townships 21 to 26s, Ranges 25 to 38e."

Utah

The Utah Southern Oil Co. and the Utah Oil Refining Co., the latter a subsidiary of the Midwest Refining Co., have made a joint agreement for drilling deeper on No. 1 King, NE SE Section 13-23-20, on the Salt Valley structure in Grand County, Utah. The well is bottomed at 3,001 feet in lime to which depth it was drilled by Utah Southern under a joint agreement with the Moab Consolidated Oil Co. It has been shut down waiting for orders since the contract depth was reached. The well was out of the red beds and in the top of the Hermosa lime of Pennsylvanian age at 1,020 feet. It has had a few shows of oil, some salt water and strata of salt in lime. The Utah Southern's No. 1-A J. L. Shafer, Section 36-26-20, which was shut down for the holidays at 2,580 feet, is preparing to resume. The crew was unable to go in on account of ice jam in the Colorado River which shut off transportation by boat. It then started in overland with the intentions of crossing the river on the ice. The Continental Oil Co.'s No. 1, Section 22-43-22, on the Boundary Butte structure in San Juan County, had a show of 3,000,000 to 5,000,000 feet of dry gas at 4,525 feet in gray lime of Pennsylvanian age, and has gone back to underream and lower the 5⅝-inch casing. The Western Venture Corp.'s No. 1 Krumvieda, Section 6-5s-21e, on the Vernal monocline in Uinta County, which topped a sand at 1,265 feet showing some oil and gas saturation in a wet hole, was deepened 1 foot from 1,282-83 feet and the quantity of oil and gas showed some increase. The 6¼-inch will be set on top of the sand for a water shutoff before drilling any deeper. This is a test of Tertiary horizons. The Utah Southern Oil Co.'s No. 1 Farnsworth, Section 29-4s-1e, in the same county, is drilling at 2,130 feet in dark oily shale, the hole caving slightly. The Phillips Petroleum Co.'s No. 1 Schick, Section 16-27-16, on the Barrier Creek Dome in Wayne County, is delayed at 4,570 feet in limey shale fishing for tools. In Box Elder County, the Leonora Mining & Milling Co.'s No. 1, Section 9-8n-7w, which is located out in the lake at the north end of the Great Salt Lake, is drilling at 1,800 feet after being shut down for some time. The company is drilling for A. P. Swobada, of New York City, who is reported financing the test. The same company's No. 1, Section 14-9n-8w, is drilling at 2,230 feet and the first sand is expected within the next 600 feet. The Utah-Pennsylvania Oil Co.'s No. 1, Section 3-10-4w, on the Penrose Dome, is drilling at 1,726 feet in lime. It had a show of oil in carboniferous shale at 1,610-1,710 feet in a wet hole. The 10-inch is at 1,300 feet. In Washington County the St. George Oil Co.'s No. 1 Hiatt, Section 30-43-14, Beehive Dome, is drilling in the Moenkopi at 715 feet.

Colorado

Pueblo County

While no important change in the Rozella Oil Co.'s No. 1 Shaw, NW NW Section 3-22-63, in Pueblo County, 12 miles southeast of Pubelo, in central Colorado, has taken place this week, the interest in the discovery has increased rather than decreased. Last week this well was reported having 500 to 700 feet of oil in the hole which was not lowered by intermittent bailing, with a little water showing along towards the last. Hundreds of people have visited the well within the past 10 days and among these were representatives of most all of the larger oil companies operating in the Rocky Mountain area. A few scouts from the Mid-Continent and Texas fields also have been attracted to the spot. The drillers run the bailers a few times for any accredited representative of an oil company, but no attempt to make a test has taken place. This is due to the conditions at the well and other factors. An old tractor was used for power and the rig was an old machine which had seen its best days and one which few would pick out to drill to the depth reached. It took 11 months to put the hole down to the present depth of 1,190 feet, but drilling was not in progress continually. Instead, holidays, Sundays and off time from other duties were the favorable periods for making depth.

One of the surprises of the discovery is the quality of the oil. A distillation test made at the Continental Oil Co.'s refinery at Florence showed a gravity of 33.8 degrees; a gasoline content of 34 per cent and paraffin 16 per cent. The oil is dark brown in color. The well is about 40 miles in an air line to the east and a little south of the Florence-Canon City Pool in Fremont County, the second oldest producing field in the country. The Florence-Canon City oil has a gasoline content of 3 to 7 per cent, the product being most valuable for its lubricant properties. The specific gravity of the Florence crude is around 30 to 31 degrees.

Waiting Developments

The larger operators appear to be inclined to wait for further developments before making up their minds as to what course to pursue. While the discovery undoubtedly will have a far-reaching effect on prospective wildcatting in eastern and southeastern Colorado, the territory immediately surrounding the well is rapidly passing into the control of small concerns and speculators. All available state-owned land within a radius of 8 miles has been taken up and there is considerable trading in leases on small tracts of fee land. While the major companies are keeping in very close touch with the situation, there is no evidence so far that they are making any deals. The Rozella Oil Co. plans to run a string of casing in the well, install a pump and a boiler to replace the old tractor, and make a test. While some water has shown in the bottom of the hole according to parties who witnessed bailing, the quantity is not large and may be coming from above. The hole has about 600 feet of 6¼-inch in it and the remainder is open. It is doubtful if a good water shutoff was obtained with this string. Regardless of what happens in this well, it proves the existence of a sand, though its identity is not definitely established, and the presence of oil in the sand. Several wells in the area are scheduled to be drilled at once. The Rozella company plans to drill an offset with standard rig. P. W. Harr and A. D. Quaintance of Denver secured a lease on the Shaw ranch covering 40 acres in the SW NE Section 34-21-63 under a contract which provides for drilling to commence before March 15. This tract is half a mile north of the discovery. The same firm also secured an option on another tract of 240 acres, drilling being dependent upon the outcome of the first well. The drilling is expected to extend to within the city limits of Pueblo. One of the owners of the Motorway camp ground, operated in connection with a bus line, says that the company has had three offers to drill a test, the land being within two block of the city hall. An Armstrong rig and casing at Pueblo en route to southeastern Colorado from Thompson, Utah, will be diverted and used by R. E. Parrish, Dean Langston and associates for drilling a well on the Denver & Rio Grand Western Railroad property at South Fifth Street, the ground at present being used for circus exhibitions. C. H. Bradler and Isidore Schuster of Pueblo filed a suit against the trustees of the Rozella Oil Co. early in the week, the object being to quiet title to the land upon which the discovery was drilled. The two claimed an interest in the leases. It was to have been heard yesterday on a motion for a temporary injunction, but later reports say that the controversy has been settled out of court.

Southeastern Colorado

One new test in southeastern Colorado commenced spudding on January 14, this being the Okla-Col Oil & Gas Co.'s No. 1 Doherty, in the SW SE SW Section 32-34s-60, in Las Animas County. The location is 24 miles west of the Branson Dome test drilled last year by the Parker Club, Inc., and 5 miles south and 12 miles east of the several gas wells near Barela operated by the Mountain States Gasoline Corp. The well started in a 12¼-inch hole and will be carried through the Cretaceous at 1,800 to 2,000 feet. The company has its headquarters at Chickasha, Okla.

The Ruby Hill Oil & Gas Co.'s No. 1 Braden, Section 24-4s-69, in Jefferson County, has not made any new hole the past week due to caving ground and the necessity of cleaning out to keep the 12½-inch close behind the tools. It is still bottomed at 712 feet.

The Major Petroleum, Inc., No. 1 Blackwolf, Section 7-2s-43, in Yuma County, is drilling below 1,300 feet and is close to the first sand in which gas is expected. It is still carrying the 15½-inch which will be pulled as soon as the 12½-inch is run and set on top of the sand.

The Platte Valley Petroleum Co.'s No. 1 Patterson, Section 24-6n-61, Greasewood Dome, in Weld County, is shut down at 4,175 feet.

The Transcontinental Oil Co.'s No. 1, Section 30-41-16, Glade structure, Dolores County, at last reports was still fishing for tools at a total depth of 4,005 feet.

In the Tow Creek Pool in Routt County the Texas Production Co.'s No. 6 Quaintance-Hocking, NE SW NE Section 18-6n-86, commenced spudding January 14 and is still spudding at 130 feet. The Hynds Oil Co.'s No. 2 State, SW NW Section 17 6-86, was estimated good for 15 bbls. at 3,110 feet, and is drilling ahead at 3,125 feet.

The White Eagle Oil & Refining Co.'s No. 1 Fordham, Section 9-2s-96, Rio Blanco County, is still sidetracking the 15½-inch bit at 432 feet total depth.

Larimer County

In Larimer County the Five Square Oil & Gas Co.'s No. 1-A State, SW cor. Section 16-4n-69, Berthoud Dome, cemented the 8¼-inch casing at 2,902 feet on top of the first sand. The plans are to carry this hole on down to 3,600 and possibly 4,100 feet to test the Dakota and underlying horizons unless it should get commercial production in the sand expected just below the present bottom. This upper sand showed considerable wet gas in two other wells drilled on the structure. The Continental Oil Co.'s No. 2 Elder, SW NE Section 18-9n-68, Wellington Dome, is drilling at 3,070 feet. This is the only well drilling, but the Continental will start two other operations on this structure shortly.

In Huerfano County the Parker Club's No. 1 fee, Section 4-28s-68, on the Badito-Alamo structure, joint with the Kinney-Coastal Oil Co., which has been idle for some time at 1,210 feet due to water shortage, has had the crew on location for several weeks and drilling was to have been resumed the first of this week.

In Moffat County, on the Iles Dome, the McCormick Oil Co.'s No. 1 Sales, SE SE Section 28-4n 92, is being abandoned at 2,730 feet on account of a bad hole. Rig is being skidded 58 feet north and No. 1-A will start from the surface. The Midwest Refining Co.'s No. 3-SD Shaw, NE NE Section 27-4-92, is bottomed at 3,233 feet in black shale and running the 6¼-inch, and its No. 24-SD Parkinson, SE NW Section 22-4-92, is still bottomed at 2,830 feet and cleaning out a bridge. Thomas McLaughlin and others' No. 1 Williams, NW SW Section 2-3-92, is drilling at 2,175 feet and carrying the 10-inch. The Texas Production Co.'s No. 1 Lloyd, SE cor. Section 21-4-92, is bottomed at 3,046 feet and underreaming at 3,000 feet. On the Moffat Dome the Texas Production Co.'s No. 11 Knowlton, SE cor. Section 33-5n-91, the rotary test to the Sundance, again is making hole and is drilling at 3,539 feet close to the Frontier.

In the Florence-Canon City district in Fremont County the Continental Oil Co.'s No. 2 Vezetti, NE NE Section 11-19-70, is a completion at 2,440 feet with an initial production of 50 bbls., and its No. 3 Vezetti, NE NE Section 11, is a location.

The Kelly Oil Co.'s No. 1 State, SE cor. NW Section 36-14-57, in Lincoln County, was depeened 6 feet to 1,403 feet, and a little oil continued to come into the hole. It will not go any deeper until a string of 5 3/16-inch casing is run and set. The string is being trucked out from Denver. This well created some interest around Thanksgiving time when it was reported showing oil. Contrary to reports, it is now stated that the well is not in a sand and that the showing is from the shale.

Wyoming

Wyoming reported no completions this week and drilling operations failed to reveal anything of importance outside of routine. In the southwestern part of the State the wildcats are not very active and most of them are shut down for the winter. The Prairie Oil & Gas Co.'s No. 1 Tucker, NW SE Section 18-13-99, on the Alkali Creek Dome in Sweetwater County, suspended until spring after cementing the 8¼-inch casing at 2,480 feet. The Ohio Oil Co.'s No. 1 Humphreys, SW NE Section 2-12-101, on the Canon Creek structure, cemented the 12½-inch at 1,907 feet and is shut down. All development work in the La Barge Field in Sublet County is at a standstill, though some of the producing wells are being operated as usual and the oil run to Opal in the Midwest pipe line. The feasibility of constructing a gasoline plant in the La Barge district is being investigated by the principal operator in that field, but it is not considered likely that construction will begin before spring in the event of a favorable decision. The plant will run on the casinghead gas and gas from shut-in wells which have a capacity of around 100,000,000 feet a day. The gas is said to be rich in both gasoline and carbon black. A few of the wells in Sublet County not shut down include the follow-

ing: The California Co.'s No. 1 Bushell, SW SE Section 11-29-115, Snyder Basin, bottomed at 2,505 feet and underreaming. The same company's No. 1 Wyss, NE SW Section 12-32-115, South Cottonwood, waiting for fuel at 1,205 feet.

Lincoln County

In Lincoln County two tests are to be drilled this year on the Fontenelle structure, according to an announcement by B. E. Taylor of San Francisco. Materials are being moved to location for one of these on the Archie Neil permit in Section 14-24-113, about 2½ miles southwest of the Fontenelle Oil Co.'s No. 1 in the NE NW Section 1-24-113, which was abandoned at 1,520 feet in the Tertiary recently. The other will be on the Holden ranch in the same area. It is reported that the Italo-American Petroleum Corp., the Zier Oil Co. and H. A. Rispin, all of San Francisco, are interested in the joint tests and that part of the equipment from the Fontenelle well will be used. The same interests also intend to drill on Section 22-15-117, in the Le Roy district in Uinta County, and will commence building rig as soon as the work on the two rigs at Fontenelle is completed. The Rispin interests have a well in the SW cor. SE Section 5-16-117, in the same district, which is shut down at 325 feet, and it is reported that this well will be drilled to completion by the new interests. The California Co.'s No. 1 Union Pacific, NE NW Section 7-17-116, Muddy Creek Dome, is drilling at 2,324 feet in white sand, and the Park City Oil & Gas Co.'s No. 1 Christensen, NE cor. Section 6-15-113, is drilling at 825 feet in lime. Minton and others' No. 1, SW SW Section 8-18-116, at Cumberland, is drilling at 950 feet in hard dry sand.

In Lincoln County the only active operation is the Midwest Refining Co.'s No. 1 Waterfall, Section 35-22-115, drilling at 2,180 feet in buff-colored sand.

Carbon County

In Carbon County the Producers & Refiners' No. 7, Section 7-26-89, Wertz Dome, is drilling on bailer at 3,510 feet, and its test on the Sherrard Dome, Section 14-25-89, is bottomed at 3,027 feet and cleaning out at 2,990 feet. The Simpson Ridge Petroleum Co.'s No. 1, SW Section 34-22-80, on the Simpson Ridge Dome, is drilling at around 1,500 feet.

In Fremont County the Producers & Refiners' No. 7, SW NW Section 14-32-95, Sand Draw, is dismantling the lubricator and will install a blowout preventer. Last depth reported was 2,917 feet, where it had approximately 65,000,000 feet of gas. The Kinney-Coastal Oil Co.'s No. 1 Dykeman, SE SW Section 22-3n-1w, Pilot Butte deep test, was due to commence spudding on January 14. This is to test all horizons down to and including the Sundance.

In Park County, in the Big Horn Basin, the Ohio Oil Co.'s No. 1 Pulley, NW NW Section 27-53-101, Cody Dome, is still trying to shut off bottom water in the Embar at a total depth of 4,780 feet and make a well out of the upper part of the sand which put 3,500 feet of oil in the hole before the water came in. The same company's No. 2 Pulley, SW NW of Section 27-53-101, one-fourth of a mile south of the discovery, has completed rig. The Producers & Refiners' No. 1, SE NW Section 7-57-97, Sage Creek Dome, is drilling in gray sand at 1,530 feet and carrying the 10-inch at 1,491 feet. The Midwest Refining Co.'s No. 36 Rosenburg, SE cor. NW Section 25-58-98, Frannie Dome, is drilling at 750 feet, and its No. 1 Kirk, SE cor. Section 23-58-98, is drilling at 766 feet. The Oregon-Wyoming Oil & Gas Co.'s No. 1, NE SW Section 30-52-101, Horse Center, is shut down at 1,040 feet for engine repairs, and the Cody Petroleum Co.'s No. 1 Nelson, SE NE Section 4-51-102, Diamond Basin, is drilling at 1,935 feet and carrying the 10-inch. This company has material on the ground for a test in the NW SW Section 27-57-96, on the Cowley structure. The Resolute Oil Co.'s No. 1, Section 17-57-101, Badger Basin, is drilling at 2,000 feet and carrying the 12½-inch. In the Oregon Basin Field there is not much drilling at present. The Enalpac Oil & Gas Co.'s No. 2 Cactus, SE cor. Section 6-51-100, is standing cemented at 3,171 feet, and the Ohio Oil Co.'s No. 1 Sonners, Account 3, SE Section 8-51-100, cemented 117 joints of 6⅝-inch at 3,785 feet. The Producers & Refiners' No. 1, Section 29-52-100, has mudded off water at 563 feet and is preparing to shut down. It probably will not resume until spring.

In Hot Springs, McPherson and others' No. 1, Section 2-44-96, Little Sand Draw, is fishing for tools at 3,197 feet, and the Texas Production Co.'s No. 1, NW SW Section 23-45-100, Skelton Dome, is drilling at 655 feet.

In Big Horn County the Prairie Oil & Gas Co.'s No. 1 Chilcote, Section 35-56-95, Little Sheep Mountain, is drilling at 2,280 feet in the Deadwood formation. The gas encountered at 1,370-8- was noninflammable. The Utah Southern Oil Co.'s No. 3, Section 29-56-97, Garland Dome, is drilling out cement for a test. The 5 3/16-inch was cemented at 3,317 feet.

Montana

During the past week, the Pondera Field completed five new wells, all on the leases of the Midwest Refining Co. All five are on Sections 15 and 16-27-4, in the central part of the development and production of the new producers ranges from 100 bbls. to 200 bbls. for the highest.

Besides the above, there are five more wells that should come in within a day or two. The Continental Oil Co.'s No. 10 Gjullin is standing cemented and should be ready to drill in any time. The Texas Production Co. also has a well in the top of the sand.

The well of the Judith Basin Oil Co. is about 3,000 feet deep on the Arrow Creek Dome and a completion is expected next week. This well is near Lewistown, Fergus County, and is a wildcat of interest. It is expected to cut the Ellis sand at around 3,100 feet and production is expected in this horizon.

Wildcats over Montana are generally shut down due to weather. Water for drilling is hard to obtain with the thermometer below zero a large part of the time and the pipe lines are often laid on top of the ground.

The O'Neil brothers leased a tract in Section 4-34-1, in Sunburst Field and drilled a well that came in dry last week. It found water in the Ellis sand at 1,443 feet.

The extension to the southeast at Sunburst is being held back by cold weather. The Hannah Porter well there is shut in and will remain so until the cold weather moderates.

The annual meeting of the Sunburst Oil & Gas Co. was held at Great Falls and Shelby, the officials and directors being re-elected. This company has about 40,000 acres of proven gas territory in Sunburst Field that will serve the Great Falls pipe line indefinitely.

ROCKY MOUNTAIN PRODUCTION
Daily Average Runs Week Ended January 19

WYOMING	
Salt Creek	32,320
Big Muddy	2,470
Grass Creek	2,360
Elk Basin	970
Frannie	270
Ferris	20
Rock River	2,400
Lance Creek	340
La Barge	2,900
Poison Spider	1,190
Oregon Basin	2,070
Osage	450
Lander	430
Byron	20
Lost Soldier	3,670
Simpson Ridge	70
Dutton Creek	50
Rex Lake	130
Hamilton Dome	720
Total Wyoming	52,860
MONTANA	
Cat Creek	1,510
Kevin-Sunburst	7,090
Pondera	2,840
Total Montana	11,440
COLORADO	
Florence	1,158
Moffat	1,016
Fort Collins	2,759
Iles Dome	1,606
Rangely	100
Tow Creek	445
Boulder	25
Total Colorado	7,109
NEW MEXICO	
Rattlesnake	926
Hogback	520
Artesia	1,085
Cap Rock	119
Table Mesa	552
Total New Mexico	3,182
Total Rocky Mountain	74,591

Engineering Problems

(Continued from Page 34)

control in drilling through a hard cap is a terrible tax on the driller's patience and that some of the things any one would do in the driller's place are the result of exasperation.

Looking at it from the engineering standpoint, the force required to shear hard material is much greater than that for soft material. That is like saying that the shearing strength of hard rock is greater than that of soft shale. This is not news to the engineer or geologist, but if it is true, then the torque required to twist the drill stem in hard rock is greater than for softer material for the same rate of feed. Naturally then one would apply a lighter feed in hard than in soft material, just as the driller does. This is opposite to the conditions described by Mr. Martin.

But in the way of additional information it is interesting to note that while drilling in hard formation a comparatively light weight must be used to avoid hang-ups, yet the bit must be kept firmly on bottom because too light pressure of the bit on bottom again results in hang-ups. Of course this sounds extremely contradictory but yet it holds true in actual practice. It is Hallam Anderson's opinion that this is due to longitudinal oscillation, making the rotary hammer like a standard bit, notching the bottom until the bit catches and hangs up there.

There is now in progress a great transition in drilling—a transition that is accumulating momentum as it progresses. To the practical operation of able drillers is being added the systematic study of the trained engineer, systematic tests, the careful analysis of facts, the study of underlying principles, and the substitution of fact for opinion. These will put this important work on a scientific basis and result in enormous progress.

REMARKS BY EDITOR

In cases of this kind where good men disagree, there is usually some logical explanation at hand if we will look for it. Conditions thought to be exceptional may be more common than was generally realized as illustrated by the wide occurrence of crooked holes which were at first thought to be exceptional.

Not long ago a prominent engineer put the following question to the writer: "Our company has a lot of rotary holes that we know are crooked. We have tried to drill straighter holes by keeping excessive weight off the bit and in this work a strange fact has been observed. We find that in many holes when we lessen the weight on the bit, and in some cases when we pull the bit up off bottom, we get the maximum torque on the drill pipe. When we lower the bit onto bottom and put weight on it we get less torque. In some cases the more weight we put on the bit the less torque we put on the drill pipe. How can this be explained?"

The question suggests a possible explanation for some of the differences in the observations and opinions brought forth by these discussions. In a deep hole that is crooked, the drill pipe resting heavily on the bit may conform most readily with the crooks in the hole. But when the bit is lifted off bottom or the load on it is lightened the tension in the drill pipe is increased thereby tending to straighten it. Any tendency for the drill pipe to straighten out in a crooked hole should increase the friction against the walls of the hole thereby increasing the torque. This might appear to yield a condition of relatively all weight and no torque or all torque and no weight depending upon the different sets of conditions involved.

DETERMINING OPEN FLOW BY PRESSURE

(Continued from Page 33)

pressed in percentages of absolute rock pressure.

A similar line of curves can be plotted for gas flowing through the siphon line. If the well is not equipped with a siphon line, the procedure of testing is the same, except that the absolute working pressure at the sand has to be calculated by correction from the friction drop due to gas flow. At present the only method of determining this friction drop in the pipe is by applying a suitable pipe line flow formula.

Gauging Capacity

When a well's potential capacity to deliver gas is gauged by any back-pressure method rather than by opening the well to the atmosphere, the principal advantages are as follows:

1. The determinations of the actual capacity of the well are more accurate. The potential delivery of the well is then judged by the pressure as it should be rather than by the volume which flows through any particular size pipe in a short period of time.

2. Gas waste is eliminated. Since back pressure on the sand reduces considerably the rate of flow from a well, it can be seen that much gas waste is eliminated by the proper application of back pressure in gauging open flows.

3. Salting and clogging of the sand is reduced. The holding of the proper back pressure reduces the differential pressure drop at the face of the sand and minimizes the possibility of salting and clogging.

4. The well can be more efficiently operated. As explained later, a well properly controlled and equipped with recording pressure gauges assists the operator in solving problems pertaining to water troubles, bad sand conditions, and other troublesome features of operation such as packer and casing leaks.

Pressure Conditions

Development in the past several years has been toward the use of pressure relations to determine open flow capacity, instead of depending entirely on volumetric measurements at the well head, with a well wide open. The ultimate goal, of course, is to eliminate entirely the necessity for blowing gas to the atmosphere at any time during the life of the well in order to obtain its open flow capacity. To accomplish this objective, the capacity of the well to deliver gas must be determined from the pressure conditions in the well. Data from about 300 wells indicate that there is a relation for any particular well between the gas available and the sand pressures. In other words, by determining as accurately as possible the ability of a gas well to deliver gas at each of several back pressures, it will be possible to determine the ability of the well to deliver gas under any pressure conditions. H. R. Pierce, consulting engineer of the Bureau of Mines, is taking the leading part in this development. It is believed that before any definite relations can be advocated, however, that some laboratory experimental tests should be made to confirm the well tests and also to clarify doubtful problems encountered in the field. The apparatus now is being built, and it is hoped that a report can be released within the next few months.

As stated previously, the combined effort of the engineers who have been working on this problem of gas conservation should result in the elimination of blowing gas to the atmosphere with the well wide open and instead depend upon pressure conditions for gauging the capacity of a well to deliver gas. The rapid progress that is being made will be seen clearly in the discussions which will follow the brief resume that has been given.

C. E. MAHONE DIES

C. E. Mahone, a Southwest Texas operator, who has been in ill health for a period of about three years, died recently at his home in San Antonio.

G. R. LIVERGOOD DIES

HOUSTON, Tex., Jan. 19.—Gerald R. Livergood, formerly of the W.K.M. Co. and inventor of several oil field devices, died at a Houston hospital recently.

MAGNETOMETER STUDY OF STATE OF ARKANSAS

(Continued from Page 30)

Searcy County, and another near Heber Springs, Cleburne County.

A syncline passing north and south through Hot Springs, Garland County, and just west of Arkadelphia, Clark County.

A syncline starting just east of Sheridan, Grant County, and running north through Little Rock, Pulaski County.

Another magnetic low extending from Des Arc, Prairie County, to Augusta, Woodruff County.

A very pronounced low through Marianna, Lee County, Wynne, Cross County, and Harrisburg, Poinsett County.

Also low trends from Hampton, Calhoun County, to Fordyce, Dallas County, and from Lake Village, Chicot County, to Arkansas City, Desha County.

Magnetic Anomalies

As has been explained previously the reading marked with an X indicates the value of vertical magnetic intensity corrected for a normal variation due to latitude and longitude. The result of this correction is to change the contours from a terraced effect to a series of closed highs and lows.

Plate 2 shows the magnetic anomalies obtained for the State when the regional corrections have been applied.

Closed magnetic highs are shown in the vicinity of:

Fort Smith, Sebastian County.
Clarksville, Johnson County.
Waldron, Scott County, and Danville, Yell County.
Clinton, Van Buren County.
Batesville, Independence County.
Jonesboro, Craighead County.
Brinkley, Monroe County.
Camden, Ouachita County.
Star City, Lincoln County.
Rosedale (Mississippi).

Closed magnetic lows are shown in the vicinity of:

Fayetteville, Washington County.
Marshall, Searcy County, and Jasper, Newton County.
Russellville, Pope County.
Harrisburg, Poinsett County, and Wynne, Cross County.
Hot Springs, Garland County.
Little Rock, Pulaski County.
Warren, Bradley County.
Lake Village, Chicot County.

General Relation Between Magnetometer Results and Geology

Figure 1 shows a generalized map of the State of Arkansas taken from "An Outline of the Petroleum and Natural Gas Resources of Arkansas," by George C. Branner, from which the following quotations are taken:

"For the purpose of discussing the oil and gas possibilities of Arkansas, as for many other purposes, the State is best divided into two general divisions, that is, the Gulf Coastal Plain area, and the Paleozoic area. The first area is shown on the accompanying map (Figure 1) as Sections 1, 2, 3 and 4, and the second as Sections 5, 6, 7, 8 and 9."

"All of the petroleum and more than half of the gas which has been produced in Arkansas up to the present time has been found in the Coastal Plain area. The beds making up this region have been the source of immense quantities of oil and gas in Arkansas, Louisiana and southern Texas. Paleozoic rocks on the other hand have produced all of the oil which has been found in Oklahoma, Kansas, north Texas and eastern United States. Up to the present time, however, the Paleozoic rocks of Arkansas have produced only gas."

"Area No. 1 is from information now available, the most favorable area in the State for prospecting for oil. It contains the oil and gas producing areas of southern Arkansas and within the limits shown contains 1) thick petroleum forming beds, and (2) the possibility of structural conditions favorable for the concentration of petroleum."

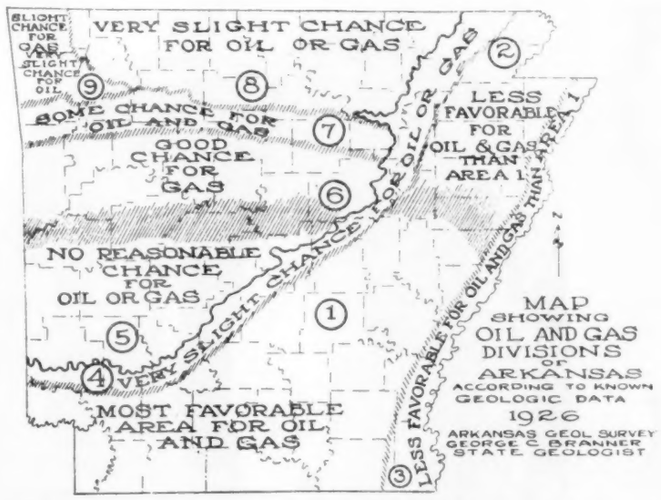

SLIGHT CHANCE FOR OIL OR GAS
VERY SLIGHT CHANCE FOR OIL OR GAS
SOME CHANCE FOR OIL AND GAS
GOOD CHANCE FOR GAS
LESS FAVORABLE FOR OIL & GAS THAN AREA 1
NO REASONABLE CHANCE FOR OIL OR GAS
VERY SLIGHT CHANCE FOR OIL AND GAS
LESS FAVORABLE FOR OIL AND GAS THAN AREA 1
MOST FAVORABLE AREA FOR OIL AND GAS
MAP SHOWING OIL AND GAS DIVISIONS OF ARKANSAS
ACCORDING TO KNOWN GEOLOGIC DATA
1926
ARKANSAS GEOL SURVEY
GEORGE C BRANNER
STATE GEOLOGIST

Figure 1—From "An Outline of Petroleum and Natural Gas Resources of Arkansas" by George C. Branner.

DEATHS IN CANADA

CHATHAM, Ontario, Jan. 19.—William McKenzie, formerly a prominent driller in the Petrolia and Oil Springs fields, died at Sarnia recently, aged 80.

Charles Ferns, for many years connected with the Oil Well Supply Co., died recently at Petrolia, Ontario, in his sixty-eighth year.

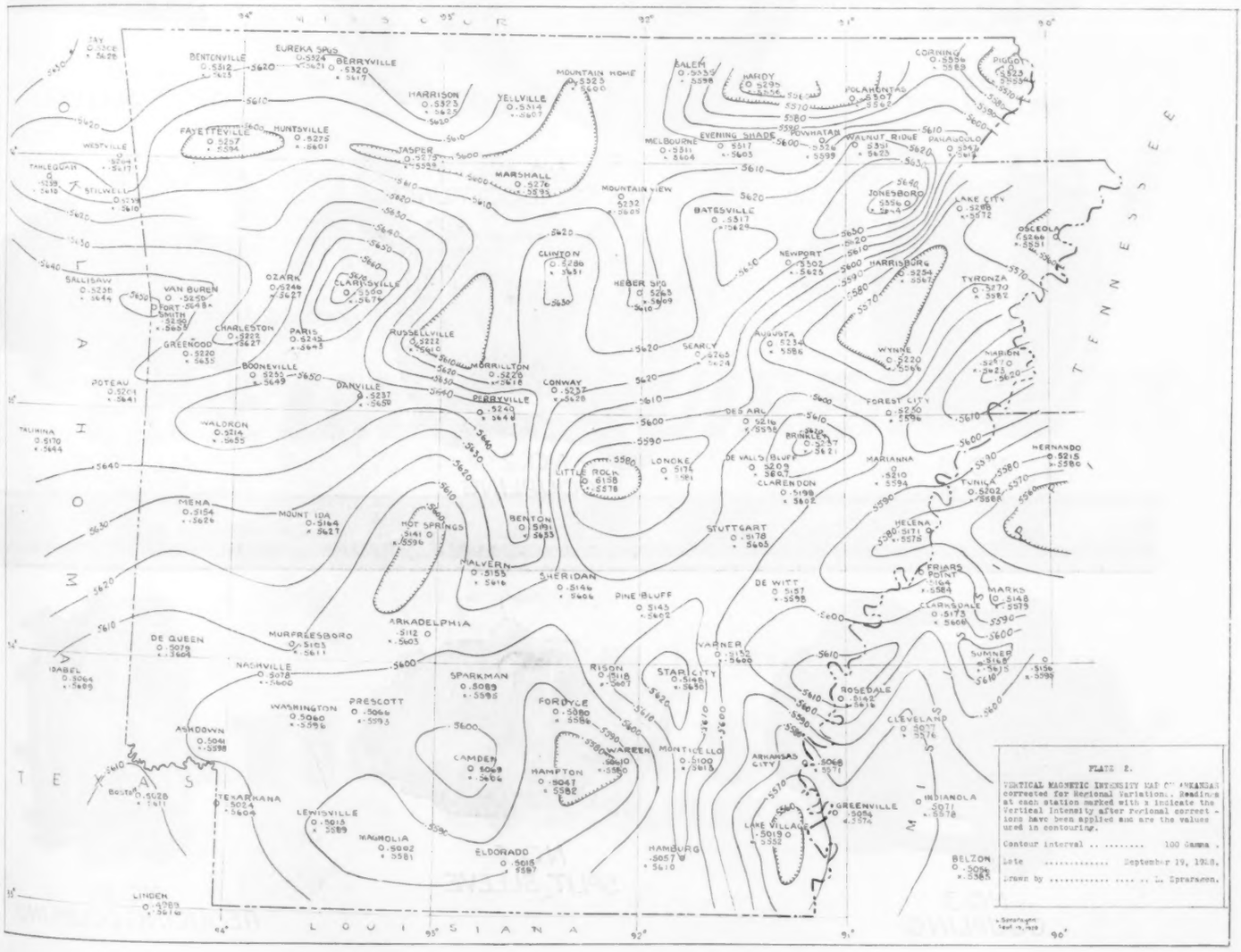


PLATE 2.
VERTICAL MAGNETIC INTENSITY MAP OF ARKANSAS
corrected for Regional Variation. Readings at each station marked with a indicate the Vertical Intensity after Regional corrections have been applied and are the values used in contouring.
Contour Interval .. .. 100 Gamma.
Date ..... September 19, 1928.
Drawn by .... L. Sprarseen.
MISSOURI
TENNESSEE
OKLAHOMA
TEXAS
LOUISIANA
MISSISSIPPI

NO. 10
MALLEABLE CLAMP

NO. 5
ALL STEEL SLEEVE

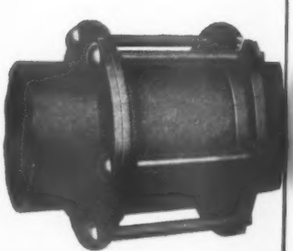
NO. 8½
SPLIT SLEEVE

NO. 1
ALL STEEL COUPLING

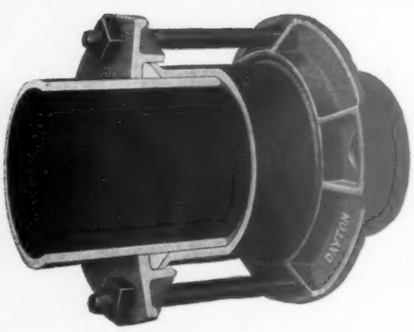
NO. 8
SPLIT SLEEVE

NO. 4
COUPLING

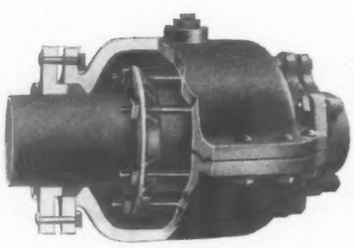
NO. 2
COUPLING



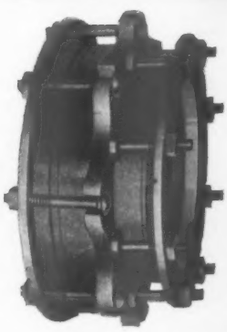
NO. 9
ALL STEEL
COLLAR LEAK CLAMP



NO. 3
COUPLING



NO. 7
SPLIT SLEEVE



NO. 1½
REDUCING COUPLING

DAYTON
PIPE LINE REQUIREMENTS

THE
NATIONAL SUPPLY
COMPANIES

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 40)

CULBERSON COUNTY

Deep Rock Oil Co.'s No. 2 Seay, 200 ft. N and 250 ft. E of CSL Sec. 20, Blk. 59, T.&P. Sur. ... Set 10-in. casing 1,137 ft.; drlg. 1,453 ft.

Hickey & Stiver's No. 1 C. O. Finley, 660 ft. N and 1,980 ft. W Sec. 20, Blk. 82 ... Hole full water; small oil show 1,331 ft.; pipe set 1,418 ft.; total depth 1,660 ft.; underreaming at 1,590 ft.; total depth 1,680 ft.

W. S. Hillyer's No. 1 McGregor, C NW Sec. 14, Blk. 81 ... Drlg. 500 ft.

Scott & Dittman's No. 1 Miller, 1,160 ft. N and 2,480 ft. E Sec. 1, Blk. 97, Public School Land ... Rainbow 1,056 ft.; 300 ft. sulphur water 1,725 ft.; shut down for casing 1,767 ft.

DAWSON COUNTY

Magnolia Petroleum Co.'s No. 1 W. A. Jetter, C Sec. 1, Blk. 34, Twp. 4n ... Top salt 1,650 ft.; top lime 3,560 ft.; set 10-in. casing 1,815 ft.; drlg. 3,905 ft.; oil show 3,856 ft.

EL PASO COUNTY

Sillix et al's No. 1 W. D. Malone, Sec. 46, James M. Day Sur. ... Set 12½-in. casing 1,010 ft.; shut down 1,010 ft.

FISHER COUNTY

Bickerstaff et al's No. 1 McWhirter, 2,640 ft. E and 150 ft. N of SW cor. of Sec. 295, Blk. 2, H.&T.C. Sur. ... Shut down 1,820 ft.

Cranfill & Reynolds' No. 1 Brown, 330 ft. S and E of NW cor. Sec. 4, W. E. Richardson Sur. ... Drlg. 1,320 ft.

Cranfill & Reynolds' No. 2 Willinkham, 1,980 ft. S and 2,310 ft. W of NE cor. Sec. 207, B.B.B.&C.R.R. Sur. ... Rig.

Cranfill & Reynolds' No. 1 Fleming, 1,980 ft. S and 2,310 ft. E of NW cor. Sec. 207, B.B.B.&C.R.R. Sur. ... Rig.

Dunnegan Bros.' No. 1 T. Henry, 330 ft. N and E of SE cor. Sec. 21, George W. Burdett Sur. No. 322, but in Sec. 4, Robert Hibbitt Sur. No. 331 ... Shut down 1,475 ft.

Hucony Gas Co.'s No. 1 D. F. Maberry, 1,978 ft. S and 188 ft. W of NE cor. Elijah Bell Sur. No. 327 ... Hole full salt water 2,735 ft.; top lime 2,960 ft.; pay 2,964-70 ft.; show oil and water.

Landreth Prod. Corp.'s No. 1 Cooper, 440 ft. SE of NE cor. NW Sec. 115, Blk. 1, H.&T.C. Sur. ... Location.

Texas-Phillips' No. 1 Hall, 330 ft. N and W of SE cor. Sec. 6, Blk. 20 ... Location.

Thomp-on et al's No. 1 Newman, 1,320 ft. N and 660 ft. W of SE cor. of SW Sec. 44, Blk. 1, H.&T.B. Sur. ... Fishing 2,460 ft.

GAINES COUNTY

Pure Oil Co.'s No. 1 A. A. Williamson, 1,650 ft. S and 330 ft. W of NE cor. Sec. 110, Blk. H. D.&W.R.R. ... Top salt 2,333 ft.; drlg. 2,368 ft.

GARZA COUNTY

Emerald Oil Co.'s No. 4 J. M. Boren, 330 ft. S and W NE cor. Sec. 136, Blk. 5, H.&G.N. Sur. ... Location.

GLASSCOCK COUNTY

Chas. Daniels et al's No. 1 Meek, 2,310 ft. W and 1,60 ft. N of SE cor. Sec. 7, Blk. 34, Twp. 3s, T.&.'. Sur. .. Spudded and shut down

Gibson & Johnson's No. 1 Mann, C NW Sec. 6, Blk. 33, T.&P. Sur. ... Shut down 1,055 ft.

R. R. Penn's No. 1 Hughes-Johnson, C NW Sec. 45, Blk. 30, W.&N.W. Sur. ... Run. 10-in. casing 585 ft.

Marland Prod. Co. et al's No. 7-A Settles, 2,310 ft. S and W of NE cor. Sec. 158, Blk. 29, W.&N.W. Sur. ... Location.

Meriweather Oil Co.'s No. 2 McDowell, 1,492 ft. N and 150 ft. E of SE Sec. 35, Blk. 34, Twp. 2s, T.&P. Sur. .. Drlg. 2,670 ft.

Sprague Oil Co.'s No. 4 Roberts, 1,650 ft. S and 330 ft. E of NW cor. Sec. 156, Blk. 29 ... Drlg. 2,250 ft.

World Oil Co.'s No. 1-C McDowell, 1,650 ft. S and 2,310 ft. W of NE cor. Sec. 21, Blk. 34 ... Drlg. 252 ft.

White Eagle Oil & Ref. Co.'s No. 1 Dunbar, C of NW Sec. 46, Blk. 34, Twp. 4s, T.&P.R.R. Sur. ... Drlg. 1,535 ft.

HOWARD COUNTY

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 2 Dora Roberts, 990 ft. S and 2,240 ft. W of NE cor. Sec. 137, Blk. 29 ... Hole full oil 2,505-50 ft.; to pump.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 3 Dora Roberts, 990 ft. S and W of NE cor. Sec. 137, Blk. 29 ... Swabbing and flowing 83 bbls. per hr. at 2,917-56 ft.

Amerada Pet. Corp. and Rycade Oil Corp.'s No. 5 Dora Roberts, 330 ft. N and 2,310 ft. W of SE cor. Sec. 128, Blk. 29 ... Set 6-in. casing 2,963 ft.

Amerada Pet. Corp. and Rycode Oil Corp.'s No. 6 Dora Roberts, 330 ft. N and 990 ft. W of SE cor. Sec. 128, Blk. 29, W.&N.W. Sur. ... Set 6-in. casing 2,950 ft.; top pay 2,954 ft.; drlg. 2,969 ft.; 2,000 ft. oil.

California's Co.'s No. 1 Settles, 2,310 ft N and W of SE Sec. 158, Blk. 28, W. & N. W. Sur ... Drlg. 777 ft.

Cosden & Co.'s No. 2 Dora Roberts-D, 1,650 ft. S and 990 ft. W of NE cor. Sec. 157, Blk. 29, W.&N.W. Sur. .. Rigging up standard tools 2,965 ft.

Cosden & Co.'s No. 2 Roberts-C, 1,540 ft. 2 and 990 ft. E of SE cor. Sec. 128, Blk. 29, W.&N.W.R.R. Sur. .... Drlg. 250 ft.

Empire Gas & Fuel Co.'s No. 2 Clay, 785 ft. N and 1,570 ft. W of SE cor. Sec. 127, Blk. 29, W.&N.W.R.R. Sur. .. Drlg. 400 ft.

F. H. E. Oil Co. et al's No. 7-B Dora Roberts, 330 ft. S and E of NW Sec. 137, Blk. 29 ... Drlg. by tools 2,600 ft.

F. H. E Oil Co.'s No. 11-B Dora Roberts, 1,700 ft. S and 2,310 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. ... Shut down 250 ft.

F. H. E. Oil Co.'s No. 5-D Dora Roberts, 2,310 ft. S. and 1,650 ft. E of NW cor. Sec. 136, Blk. 29 ... Set 6-in. casing 2,930 ft.; shut down.

Green River Oil & Ref. Co.'s No. 6 H. R. Clay, 1,315 ft. N and 1,970 ft. W of SE cor. Sec. 127, Blk. 29, W.&N.W.R.R. Sur. ... Drlg. 1,312 ft.

Green Oil Co. et al's No. 1 J. W. Furrh, C SW cor. Sec. 11, Blk. 31 ... Top lime 2,100 ft.; set 6-in. casing 2,865 ft.; shut down 3,503 ft.

Green et al's No. 1 Slaughter, C SW Sec. 32, Blk. 31, Twp. 3n, T.&P.R.R. Sur. ... Bldg. rig.

Gulf Prod. Co.'s No. 5 Clay, 990 ft. S and 330 ft. W of NE cor. of their 320-acre lease, Sec. 155, Blk. 29, W.&N.W. Sur. ... Location.

L. C. Harrison et al's No. 1 G. M. Podge Est., SE cor. Sec. 9, Blk. 30, Twp. 1s, T.&P. Sur. ... Hole full salt water 1,475-1,505 ft.; top lime 1,825 ft.; show oil 2,972-74 ft.; hole full fluid 3,257 ft.; total depth 3,257 ft. plugged back to 3,000 ft. to shoot.

Henshaw Oil Corp.'s No. 2-A Settles, 1,884 ft. E and 330 ft. S ond NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. .. Pay 2,252-97 ft.; shot with 225 qts. at 2,267-97 ft.; 215 bbls.

Howard County Oil Corp.'s No. 1 Kloh, 990 ft. S and 1,170 ft. E of NW cor. Sec. 5, Blk. 32, Twp. 2s, T.&P.R.R. Sur. ... Junked hole 1,005 ft.; skidded derrick 160 ft. west and drlg. 625 ft.

Hyer & Yates' No. 3 Clay, 990 ft. S and 2,310 ft. W of NE cor. Sec. 155, Blk. 29, W.&N.W. Sur. ... Rig.

Laurel & Cosden's No. 8 Dora Roberts, 380 ft. W and 2,310 ft. N of SE cor. Sec. 136, Blk. 29 ... Drlg. 2,900 ft.

Laurel & Cosden's No. 9 Roberts, 1,650 ft. N and 330 ft. W of SE cor. Sec. 136, Blk. 29, W.&N.W. Sur. ... Drlg. 1,590 ft.

Laurel Oil & Gas Co. and Cosden's No. 10 Dora Roberts, 990 ft. N and 330 ft. W of SE cor. Sec. 136, Blk. 29, W.&N.W. Sur. ... Derrick.

Magnolia Pet. Co.'s No. 13 Dora Roberts, 2,440 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. ... Rigging up standard tools 2,927 ft.; shut down.

Magnolia Pet. Co.'s No. 16-D Dora Roberts, 990 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. ... Rigging up standard tools 2,440 ft.

Marland Prod. Co.'s No. 2-C Chalk, 330 ft. S and 1,650 ft. W of NE cor. Sec. 140, Blk. 29 ... Drlg. 1,440 ft.

Marland Oil Co.'s No. 3-C Chalk, 660 ft. S and 2,440 ft. W of NE cor. Sec. 140, Blk. 29, W.&N.W. Sur. ... Drlg. 620 ft.

Marland-Texon Prod. Co.'s No. 1 Eason, 2,638 ft. S and E of SW cor. Sec. 124, Blk. 29, W.&N.W. Sur. ... Swabbing 150 bbls. daily 2,266-91 ft.

2,513 ft. E of NW cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. Sur. ... Drlg. 2,192 ft.

Marland Oil Co.'s No. 8-A Settles, 2,310 ft. N and E of SW cor. Sec. 158, Blk. 29, W.&N.W. Sur. ... Location.

Merrick & Bristow's No. 8 Dora Roberts, 990 ft. N and 330 ft. E of SW cor. Sec. 137, Blk. 29, W.&N.W. Sur. .. Drlg. 800 ft.

Phillips Pet. Co.'s No. 1 J. Thomas, 330 ft. N and W of SE cor. Sec. 13, Blk. 33, Twp. 1n, T.&P. Sur. ... Topped lime 3,039 ft.; hole full sulphur water; drlg. 3,710 ft.

Pure Oil Co.'s No. 9 Chalk, 990 ft. N and W of SE cor. Sec. 125, Blk. 29, W.&N.W. Sur. ... Drlg. 1,260 ft.

Shell Pet. Corp.'s No. 1 Settles, 990 ft. E and 330 ft. N of SW cor. Sec. 135, Blk. 29 ... Drlg. 1,769 ft.

Sun Oil Co.'s No. 6 Settles, 915 ft. N and 330 ft. W of SE cor. Sec. 135, Blk. 29, W.&N.W. Sur. ... Drlg. 1,118 ft.

Taylor-Link Oil Co.'s No. 2 Kloh-Rumsey, 1,884 ft. E and 150 ft. N of SW cor. Sec. 3, Blk. 32, Twp. 2-S, T.&P.R.R. Sur. ... Drlg. 960 ft.

Ward Oil Co.'s No. 3 Dora Roberts, 2,310 ft. N and E of SW cor. Sec. 137, Blk. 29 ... Drlg. 1,600 ft.

Ward Oil Co.'s No. 4 Dora Roberts, 2,310 ft. N and E of SW cor. Sec. 137, Blk. 29, W.&N.W.R.R. Sur. ... Top pay 2,946 ft.; drlg.

Ward Oil Co.'s No. 5 Roberts, 1,650 ft. N and 330 ft. E of SW cor. Sec. 137, Blk. 29 ... Shut down 1,928 ft.

Witherspoon et al's No. 1 Kloh-Rumsey, 2,970 ft. E and 150 ft. N of SW cor. Sec. 3, Blk. 32, Twp. 2s, T.&P.R.R. Sur. ... Coring 2,159 ft.

HUDSPETH COUNTY

American Land Co.'s No. 1 Lockhart & Roseborough, C SE Sec. 5, School Blk. 21 ... Total depth 260 ft.; rebuilding rig.

California Co.'s No. 1 University, 3,821 ft. N and 2,554 ft. E of SW cor. Sec. 19, Blk. E ... Total depth 352 ft.; shut down, crooked hole.

Western States Oil Co.'s No. 1 Moore, C SE Sec. 16, Blk. 71, Twp. 6, T.&.'. Sur. ... Straightreaming 2,700 ft.; total depth 2,740 ft.; fishing pipe.

Western States Oil Co.'s No. 1 Gardner & Moseley, NE NW Sec. 12, Blk. 18 ... Hole full water 2,945 ft.; underreaming 8¼-in. casing at 2,840 ft.; trying to get water shut off; shut down 3,140 ft.; trying to pull casing.

IRION COUNTY

Fuhrman Pet. Co.'s No. 1 J. O. Suggs, lease 1, C SE Sec. 3,024, Blk. 24, H.&T.C. Sur. ... Rig.

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 2, C SW Sec. 3,029, Blk. 24, H.&T.C. Sur. ... Location.

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 3, C SE Sec. 3,009, Blk. 24, H.&T.C. Sur. ... Moving in material.

Kimbrough & Flinchbaugh's No. 1 Tankersley, 150 ft. S and 200 ft. W of NE cor. Sec. 712, Ford Willig Sur. .. Spudding.

Kimbrough & Tuel's No. 1 J. M. Nutt, 1,920 ft. S, 200 ft. E of NW cor. Sec. 5, Gonzales Co. School Land ... Set 6-in. casing 1,360 ft.; show oil and gas; shut down 1,400 ft.

Merizon Interests' No. 1 Harlan Horney, 2,440 ft. N and 150 ft. from W lines of Sec. Z, Blk. 3, H.&T.C. Sur. .. Drlg. 100 ft.

Signal Oil Co.'s No. 2 Suggs, 5,240 ft. from N line and 896 ft. from W line, Sec. 23, Blk. 27, H.&T. C. Sur. ... Location.

F. E. Webb et al's No. 1 J. M. Nutt ... Shut down 2,510 ft.

Wesley West et al's No. 1 J. D. Suggs, SE NW SE Sec. 19, Blk. 7, H.&T.C. Sur. ... Top pay 3,368 ft.; swabbed 35 bbls. oil and 40 bbls. water 35.8 gravity oil; drlg. 4,940 ft.

JEFF DAVIS COUNTY

J. K. Hughes Dev. Co.'s No. 2 Means, 1,622 ft. N line, 600 ft. W line Sec. 345, H.&T.C. Sur. ... Show gas 3,271 ft.; black lime; slight show gas; drlg. 3,350 ft.

JONES COUNTY

Anna Belle Oil Co.'s No. 1 Bickley, 330 ft. S and E of NW cor. SE NE Sec. 50, Blk. 18, T.&.'. Sur. ... Rig.

E. P. Campbell et al's No. 2-C Herndon, 330 ft. N and E of SW cor. NW Sec. 6, M.E.P.&P. Sur. ... Drlg. 1,240 ft.

Cosden & Co.'s No. 1 Brown, 200 ft. N and 300 ft. W of SE cor. J. H. Grayson Sur. ... Spudding.

Cosden & Tuel Oil Co.'s No. 1 Bickley, 320 ft. N and 319 ft. E of SW cor. S half NW Sec. 50, Blk. 18, T.&P. Sur. ... Rig.

Grisham & Hunter's No. 1 Tiner, 311 ft. N and 330 ft. W of SE cor. Gabriel Zumwalt Sur. ... Rig.

Mid-Sun Oil Corp.'s No. 1 George Hoehn, 660 ft. N and W of SE cor. SE 40 ac. of N 160 ac. of W 320 ac. of A. Crain Sur., A-152 ... Drlg. 1,975 ft.

McNeeley et al's No. 1 Roscoe Bland, 1,175 ft. N and 240 ft. W of SE cor. Subdivision 20, A-164, DeWitt Co. School Land ... Spudded and shut down.

Phillips Pet. Co.'s No. 1 Campbell, 330 ft. S and E of NW cor. SE 41.5 ac. of S 166 ac. of N 180 ac., 4½ of Sec. 15, Blk. 19, T.&P.R.R. Sur. ... Drlg. 2,295 ft.

Phillips Pet. Co.'s No. 1 Winters, Sec. 19, Blk. 19, T.&P. ... Drlg. 2,685 ft.

Sedwick O. & G. Co.'s No. 1 Routh, 1,250 ft. N, 2,500 ft. W SE cor. 299-ac. tract, Austin & Williams Sur. 355-A-7 ... Rig.

Sinclair O. & G. Co.'s No. 2 Buckley, 975 ft. S, 320 ft. E of NW cor. N half NE cor. Sec. 50, Blk. 18, T.&P. R.R. Sur. ... Shot with 25 qts. 2,505-13 ft.; drlg. 2,972 ft.

U. L. Tomberlin's No. 1 Horn, 1,980 ft. N and 600 ft. E of SW cor. of N 502 ac. of Penney Sur. A-283 ... Spudded and shut down.

LOVING COUNTY

Lockhart & Co.'s No. 1 H. L. Lepp, 330 ft. each way from S cor. of Sec. 3, Blk. 2, W.&N.W. Sur. ... Cem. 10-in. 578 ft.

LYNN COUNTY

Miller et al's No. 1 May, 500 ft. N of C of S L of Sec. 10, Blk. 7, E.L.R.R. Sur. ... Spudded and shut down.

MENARD COUNTY

Carpenter & Robbins' No. 1 Kothman, NW cor. SW SW Sec. 22 ... Shut down 600 ft.

Sorrels & Jackson's No. 1 F. Wilhelm, C NE Sec. 6, Blk. C, Brooks & Burleson Sur. ... Drlg. 1,150 ft.

MIDLAND COUNTY

Shoup et al's No. 1 Roy Parks, C NW Sec. 34, Blk. 41, Twp. 2s, T.&P. Sur. ... Top salt 1,700 ft.; cem. 8⅝-in. casing 2,770 ft.; show oil 3,330 ft.; shut down 4,980 ft.

MITCHELL COUNTY

California Co.'s No. 6 Foster, Lease 1, 990 ft. N and 2,310 ft. E of SW cor. Sec. 6, Blk. 29, Twp. 1s, T.&P. Sur. ... Drlg. 2,260 ft.

E. P. Campbell et al's No. 1 Pond, 1,065 ft. W, 660 ft. N of SE cor. Sec. 79, Blk. 27, T.&.'. Sur. ... Rerun 12½-in. casing 730 ft.; drlg. 2,375 ft.

Magnolia Pet. Co.'s No. 6 Foster, 1,980 ft. N and E of SW cor. Sec. 17, Blk. 29, Twp. 1s, T.&P.R.R. Sur. ... Location.

Simms Pet. Co.'s No. 1 Elwood, C SE of Sec. 29, Blk. 18, S.P.R.R. Sur. ... Moving in material.

Teas & Wheeler's No. 1 Radford, 1,320 ft. N and W of Sec. 1, Blk. 27, T.&P. Sur. ... Drlg. 3,325 ft.

NOLAN COUNTY

L. G. Bradstreet et al's No. 1 Kuteman, C NW Sec. 95, Blk. X, T.&P. Sur. ... Rig.

Herbert Oil Co.'s No. 1 Pepper, C N half Sec. 32, Blk. 22, T.&P. Sur. ... Show gas 3,160 ft.; hole full sulphur water 3,190-3,202 ft.; shut down 3,655 ft.

C. M. Root et al's No. 1 Simpson, 330 ft. S and W of NE cor. SE Sec. 33, Blk. 19, T.&P. Sur. ... Run 12½-in. casing 525 ft.; drlg. 2,130 ft.

W. E. O & R. Co.'s No. 1 Allyn, 600 ft. E and 1,720 ft. N of SW cor. Sec. 48, Blk. 20, T.&P. Sur. ... Underreaming 10-in. casing 870 ft.; shut down 2,530 ft.

PECOS COUNTY

Alexander & Lyle's No. 1 Myrtle Sellman, C SW SE Sec. 20, Blk. Z, T.S.Ry. Sur. ... Top salt 814 ft.; top lime 1,602 ft.; 3,400,000 ft. gas from 1,611-26 ft.; spraying very little oil; sulphur water 1,652 ft.; shut down 1,655 ft.

George Anderson's No. 1 University, C Sec. 11, Blk. 17.... Top salt 1,030 ft.; 7,000,000 ft. gas; drilled deeper to 1,981 ft.; 7 bbls. fluid, mostly water.

M. H. Black's No. 1 P.V.O. Co., 2,310 ft. from SE and 1,650 ft. from SW lines Sec. 22, Blk. 10, H.&G.N. Sur... Location.

California Co.'s No. 1 Smith, Lease 4, 1,010 ft. from N and E line Sec. 15 Blk. 194, G.C.&S.F. Sur..... Coring 1,623 ft.

The California Co.'s No. 3 Smith, Lease 1, 1,789 ft. from N and 1,005 ft. from W lines, Sec. 21, Blk. 194, G.C.&S.F.R.R. Sur..... Rig.

California Co.'s No. 7 Smith, Lease 1, 998 ft. from S and 1,738 ft. from W lines, Sec. 23, Blk. 194, G.C.&S.F.R.R. Sur..... Rig.

M. C. Dibble & Hale's No. 1 Bonebrake, Sec. 115, Blk. 8, H.&G. W. Sur., elev. 2,555 ft..... Top lime 1,305 ft.; set 6-in. casing 1,610 ft.; shut down 2,004 ft.

Ditto Oil Co.'s No. 1 J. M. Montgomery, Sec. 104, Blk. 351, A-16,387..... Shut down 660 ft.

Doran & McGee's No. 1 P.V.O. Co., 150 ft. from SE and SW lines Sec. 22, Blk. 10, H.&G.N. Sur..... Location.

Matador Oil Co.'s No. 3 Smith, 2,310 ft. from N and 990 ft. from E lines, Sec. 24, Blk. 194, G.C.&S.F.R.R. Sur..... Rig.

Mauch & Kroger's No. 1 Holmes, Sec. 5, Blk. 178, T.C. Sur..... Shut down 1,010 ft.

McCarty Oil Co.'s No. 1 A. A. Gray, 1,520 ft. from S and 150 ft. from W lines Sec. 591, Abst. 3,010..... Drlg. 100 ft.

Mid-Kansas Oil & Gas Co.'s No. 12-C Yates, 811 ft. from N and 871 ft. from W lines Sec. 60, Blk. 1, I.&G.N. R.R. Sur..... Drlg. 1,090 ft.

Mid-Kansas O. & G. Co.'s No. 27-B Yates, 250 ft. N and 845 ft. E from NW cor. Sec., 60, Blk. 1, I.&G.N.R.R. Sur..... Drlg. 1,345 ft.; top pay 1,175 ft.; 157 bbls. per hour.

Pecos Valley Oil Co.'s No. 2 fee, 1,620 ft. from SW and 1,320 feet from NW Sec. 22, Blk. 10, H.&G.N.R.R. Sur..... Drlg. 100 ft.

Phillips Pet. Co.'s No. 1 J. L. Nutt, 2,310 ft. from W and 330 ft. from S lines Sec. 9, Blk. 125,T.&St. L. Sur..... Drlg. 965 ft.

Phillips Pet. Co.'s No. 1 Ramsey, 990 ft. from N and E lines, Sec. 17, Blk. 194, G.C.&S.F. Sur..... Location.

Stein & McGee's No. 1 Louis Paterson, 150 ft. SE of NW line, 150 ft. NE of SW Sec. 34, Blk. 10, H.&G.N. .... Location.

R. J. Spikes' No. 1 George Brown..... Shut down 700 ft.

Schumaker et al's No. 1 Williams et al, 330 ft. N of middle of S line Sec. 1, Blk. 117, G.C.&F.F..... Shut down 492 ft.

Southern C. O. P. Co.'s No. 1 Scharbauer Cattle Co., SW cor. Sec. 21, Blk. 134, T.&S.L. Sur..... Show gas 1,455-60 ft.; water 3,175 ft.; fishing 3,380 ft.

Talbot & Ditman's No. 1 Unsicker, 1,320 ft. from E and 660 ft. from S lines, Sec. 25, Blk. 10, H.&G.N..... Drlg. 770 ft.

Transcontinental Oil Co.'s No. 1 University, NE NW SW Sec. 18, Blk. 18..... Top lime 1,155 ft.; fishing 4,130 ft.

Trees Oil Co.'s No. 1 Trees, 330 ft. from N and E L of Sec. 63, Blk. 8..... Location.

World Oil Co.'s No. 1 Kloh, Sec. 47, Blk. 45, Twp. 8, T.P.R.R. Sur., elev. 2,810 ft..... Shut down 3,105 ft.

PRESIDIO COUNTY

Eastland Oil Co.'s No. 1 Smith, C Sec. 17, Certificate 463, or Blk. 351, G.C.&S.F.R.R..... Spudded and shut down.

Phillips Pet. Co., Empire G. & F. Co., Delmar Oil Co. and C. E. Miller's No. 1 Tootle Est., C NE Sec. 75, Blk. 3, D.&P.R.R. Sur..... Show wet gas 1,270 ft.; drlg. blue shale 1,960 ft.

L. C. Brite's No. 1 Lee, Sec. 50, Blk. 12, G.H.&S.A. Sur., center of section..... Shut down 4,152 ft.; show oil 4,130 ft.; set 6-in. casing 4,152 ft.; drlg. 4,375 ft.

REAGAN COUNTY

Big Lake Oil Co.'s No. 1-C University, 2,598 ft. S and 250 ft. W of NE cor. Sec. 1, Blk. 2, University Land.. Location.

Big Lake Oil Co.'s No. 2-C University Land, 2,109 ft. N and 926 ft. W of SE cor. Sec. 1, Blk. 2, University Land..... Location.

Big Lake Oil Co.'s No. 3-C University Land, 625 ft S and 250 ft. W of NE cor. Sec. 1 Blk. 2, University Land..... Location.

The California Co.'s No. 5 University, 2,310 ft. from N and E lines Sec. 16, Blk. 7, University Land..... Drlg. 664 ft.

Texon O. & L. Co.'s No. 1-B University Group 1..... Top pay 6,250 ft.; hole full of oil; well made two small heads; oil sand 8,482 ft.; total depth 8,525 ft.; flowing 1,450 bbls. oil, 13,000,000 ft. gas daily.

REEVES COUNTY

D. P. Davis et al's No. 1 H. C. McCart, 300 ft. S and 200 ft. W of NE cor. S half NW Sec. 26, Blk. C-18..... Shut down 25 ft.

Exploration Co.'s No. 1 A. A. Kinney, 1,500 ft. W of NE cor. Sec. 26, Blk. C-18, Public School Land, elev. 2,847 ft..... Total depth 2,900 ft.; shut down.

Dr. Kits's et al's No. 1 Kloh & Rumsey, 330 ft. N and W of SE cor. Sec. 5, Blk. 54, Twp. 5, T.&P. Sur..... Set 8-in. casing 1,010 ft.; total depth 1,107 ft.

David R. Thompson's No. 1 A. A. Eddins..... Swedging casing 5,658 ft.; pulling 5-in. casing.

Robert Penn et al's No. 1 Bowles, 2,310 ft. SW of NE cor. Sec. 36, Blk. 50, Twp. 8, T.&P.R.R. Sur..... Oil show 226 ft.; drlg. 935 ft., anhydrite.

Lee O. White et al's No. 1 Kloh-Rumsey, 660 ft. S and E of NW cor. Sec. 5, Blk. 51, Twp. 10, T.&P. Sur..... Bldg. rig.

RUNNELS COUNTY

Boyce et al's No. 1 E. O. Lange, 2,300 ft. S and 6,900 ft. W of NE cor. Austin & Williams Sur. No. 262..... Drlg. 1,040 ft.

Foster et al's No. 1 Currie, 1,866 ft. SE of NW line, 335 ft. SW of NE L. Gray Carroll Sur..... Spudding.

R. D. Hamilton et al's No. 1 A. Spill, 1,320 ft. S and W of NE cor. A. Spill 881 acres, out of Thomas R. Webb Sur. 358..... Shut down 100 ft.

McLean et al's No. 1 G. W. Clayton, 150 ft. N line, 270 ft. from W line Sec. 135, E.T.R.R..... Shut down 1,185 ft.

Nourse & Tilton's No. 1 R. A. Stokes, 200 ft. S, 600 ft. E of NW cor. G.C.&S.F. Sur. No. 2..... Shut down 2,340 ft.

R. B. Summers et al's No. 1 J. W. Reese, M. J. Parramore Sur. 26..... Shut down 1,650 ft.

Union Oil Co. of Nevada's No. 1 W. E. Allen, 1,000 ft. N and W of SE cor. Sec. 1, H.E.&W.T. Sur..... Drlg. 2,340 ft.

Vacuum Oil Co.'s No. 1 Brevard, 2,150 ft. N and 302 ft. E of SW cor. Lot 21, D. Diaz Sur. No. 532..... No show in sand at 2,525-29 ft.; shut down 2,580 ft.

SCHLEICHER COUNTY

J. F. Long and O. C. Long's No. 1 W. H. Williams, NE cor. Sec. 28, H.E.&W.T.R.R. Sur..... Shut down 275 ft.

SCURRY COUNTY

I. B. Mims et al's No. 1 J. J. Koonsman, Sec. 216, Blk. 2, H.&T.C. Sur..... Spudded and shut down.

G. E. Dieckman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur..... Drlg. 1,540 ft.

STERLING COUNTY

F. & G. Oil Co.'s No. 1 W. L. Foster, C SE Sec. 20, Blk. 12, S.P.R.R. Sur..... Show oil 1,296-98 ft. and 1,356-58 ft.; drlg. 1,730 ft.

SUTTON COUNTY

Phillips Pet. Co.'s No. 1 A. G. Holman, 2,310 ft. S and 330 ft. W NE cor. Sec. 25, C.C.S.D.&N.G.R.R. Sur..... Drlg. by tools 5,770 ft.

Southern C. O. P. Co.'s No. 1 Allison, 2,310 ft. S and 330 ft. W of NE Sec. 44, Blk. K, G.H.&S.A. Sur..... Drlg. 500 ft.

TAYLOR COUNTY

Burnham et al's No. 1 A.M.Y.X..... Shut down 2,055 ft.

Grisham-Hunter Corp.'s No. 1 Campbell, 330 ft. S and E of NW cor. SW Sec. 65, Blk. 19, T.&P. Sur..... Rig.

Mid-Continent Oil & Gas Co.'s No. 1 Taylor, 990 ft. W 215 ft. N SE cor. 100-ac. tract, Sec. 18, Guadalupe School Land Sur..... Drlg. 2,073 ft.

Wentz Oil Corp.'s No. 1 Armour, 375 ft. N and 330 ft. W of SE cor. W half Sec. 16, Blk. 6, S.R.R.R. Sur..... Moving in material.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett, C NW Sec. 155, Blk. D, M.-K.-T.R.R. Sur..... Spudded and shut down.

Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Blk. D-7, E.L.&R.R. Sur..... Shut down 1,749 ft.

Mrs. J. B. McPhee's No. 1 Sam Bell, C Sec. 78, Blk. D-7, E.L.&R.R. Sur..... Location.

Milham Exploration Co.'s No. 1 Bassett, Sec. 76, Blk. Y, W. E. Robertson Sur..... Cem. 6⅝-in. casing 3,986 ft.; drlg. 4,475 ft.; lighting cave.

Woodley & Jones' No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&N.G.R.R. Sur..... Shut down 150 ft.

TERRY COUNTY

Kingsland O. & P. Co.'s No. 1 Brownfield, C NW SW SW Sec. 7, Blk. 1-A, E.L.R.R. Sur..... Shut down 4,375 ft.; preparing to resume drilling.

TOM GREEN COUNTY

Collins et al's No. 1 Jones, CSL Sec. 646, Shaffer Sur..... Shut down 1,800 ft.

Fitzgerald & Tallaferro's No. 1 Bennett, C SW Sec. 1,628, E. H. Ringer..... Shut down 1,920 ft.

F. P. Green et al's No. 1 fee, 575 ft. from N and 1,450 ft. from W lines Sec. 165, District 11, S.P.R.R. Co. Sur..... Set 8-in. casing 1,810 ft.

McLaughlin & Ridge's No. 1 R. Q. Holder, 3,140 ft. N and 80 ft.W SE cor. J. P. Parker Sur. (3,000-ft. test)..... Show gas 1,757-59 ft.; shut down 3,005 ft.; hole full water 2,986 ft.

UPTON COUNTY

Champlin Oil & Ref. Co.'s No. 4 J. F. Lane, 990 ft. from S, 330 ft. from W line of SE Sec. 2, G.C.&S.F. Sur..... Top pay 1,940 ft.; pumping 40 bbls. oil and 470 bbls. water; shut down 1,979 ft.

Humble Oil & Ref. Co.'s No. 10 Ricker, 2,310 ft. from NE line and 3,280 ft. from NW line, Sec. 5, Mary Denton Sur..... Drlg. 2,019 ft.

YOAKUM COUNTY

Weekley Oil Corp.'s No. 1 Knight, C NW Sec. 793, Blk. D, John Gibson Sur..... Rigging up standard tools.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 30, Blk. 4, I.&G.N. Sur., elev. 1,175 ft..... Shut down 4,600 ft. (corrected).

O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft..... Gas sand 2,491-2,520 ft., tested 125,750 ft. gas; reset 8-in. 2,511 ft.; shut down 4,210 ft.

Producers Oil Co. et al's No. 1 Everett Bros., 2,310 ft. S and 330 ft. E of NW cor. Sec. 40, Blk. DB, C.C.S.D.&R.G.N.G. Sur..... Shut down 1,573 ft.

Dyar Bros. et al's No. 1 Wilson, 6,830 ft. N NE cor. Sec. 1, T.&P. Sur., thence 1,680 ft. E Sec. 115, Blk. E, G.C.&S.F. Sur..... Show oil and gas 1,053 ft.; shut down 2,605 ft.

Valvert Oil Corp.'s No. 1 Bassett, C NE Sur. 47, Blk. Y.... Set 15½-in. casing 767 ft.; set 10-in. casing 1,510 ft.; shut down 1,636 ft.

WARD COUNTY

E. B. Lovelace et al's No. 1 Redman, 1,980 ft. NE of SW line and 1,980 ft. SE of NW line, Sec. 162 Blk. 34, H.&T.C.R.R. ..... Spudding and shut down.

Prairie O. & G. Co.'s No. 1 Sealy Est., 1,320 ft. S and W Sec. 95, Blk. A, G.M.M.B.&A. Sur..... Top salt 1,073 ft.; 5,000,000 ft. gas 2,526 ft.; gas decreased to 2,000,000 ft. at 2,837 ft.; hole full sulphur water 3,450 ft.; 5,000,000 ft. gas 2,526 ft.; shut down 3,505 ft.; trying to complete as gasser; plugged back to 2,531 ft.

Rector Oil Co.'s No. 1 Johnson, 1,150 ft. NW, 5,160 ft. NE Sec. 10, Blk. 32, H.&T.C..... Top salt 715 ft.; drlg. 2,507 ft.

Talbot, Dittman & Atlantic O. P. Co.'s No. 1 Dorr, 1,320 ft. from SE line and 660 ft. from SW line of Sec. 9, Blk. 5, H.&T.C.R.R. Sur..... 3 bbls. water per hr. 910 ft.; set 10-in. casing 770 ft.; shut down 2,570 ft.

WINKLER COUNTY

Amerada Pet. Corp.'s No. 2 Daugherty, SW cor. SE Sec. 3, Blk. 74..... Cem. 6-in. casing 2,657 ft.; est. 85,000,000 ft. gas at 3,110 ft.; slight spray oil and water; killing well.

Amerada Pet. Corp.'s No. 3 Daugherty, NW cor. NE SE Sec. 3, Blk. 74..... Top lime 2,812 ft.; running 8¼-in. casing 2,824 ft.

Atlantic Prod. Co.'s No. 4 Hendricks, SW W half NE Sec. 44, Blk. 26..... Drlg. 715 ft.

V. T. Bolin et al's No. 2 Brown, 2,000 ft. S and W of NE cor. Sec. 4, Blk. B-5, Public School Land..... Shut down 210 ft. water.

Barnsdall Oil Corp.'s No. 1 Tobe Morton, 330 ft. N and E of SW cor. Sec. 26, Blk. B-12..... Oil show 3,070 ft.; set pipe 3,128 ft.; preparing to resume drilling.

Barnsdall Oil Corp.'s No. 2 Tobe Morton, 1,650 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12..... Set 12½-in. casing 547 ft.; drlg. 1,485 ft.

Barnsdall Oil Corp.'s No. 3 Tobe Morton, 990 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12..... Cellar.

Empire Gas & Fuel Co.'s No. 2 Daugherty, 330 ft. N and 2,310 ft. E of SW Sec. 3, Blk. 74..... Top lime 2,690 ft.; coring 3,105 ft.; 15,000,000 ft. gas 3,090 ft.; top pay 3,045 ft.; rigging up standard tools at 3,150 ft.; est. 66 bbls. daily, 10,000,000 ft. gas.

Empire Gas & Fuel Co.'s No. 3 Daugherty, 330 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. 74..... Top lime 2,774 ft.; cem. 9-in. casing 2,781 ft.; fish ng 3,050 ft.

Empire Gas & Fuel Co.'s No. 1-B Daugherty, 2,310 ft. S and 990 ft. W of NE cor. Sec. 3, Blk. 74..... Top lime 2,823 ft.; oil and gas show at 3,165 ft.; total depth 3,165 ft.

Gulf Prod. Co.'s No. 3 Cowden, 1,310 ft. N, 330 ft. E of SW of their 240-ac. tract, Sec. 3, Blk. B-12..... Top salt 1,300 ft.; drlg. 1,342 ft.

Gulf Prod. Co.'s No. 4 Cowden, 495 ft. N and 330 ft. E of SW cor. of 240-acre lease, Sec. 3, Blk. B-12..... Location.

Gulf Prod. Co.'s No. 2 Hendricks, 1,330 ft. N and 330 ft. W of SE cor. NW Sec. 44, Blk. 26, School Land.. Drlg. 1,016 ft.

Gulf Prod. Co.'s No. 2 O'Brien, NW cor. Sec. 31, Blk. F.... Cem. 8¼-in. casing 2,672 ft.; top lime 2,723 ft.; cem. 6-in. casing 2,798 ft.; 100,000 ft. gas at 2,935 ft., sandy lime; shut down 2,973 ft.

Gulf Prod. Co.'s No. 3 O'Brien, Sec. 31, Blk. F..... Set 10-in. casing 2,150 ft.; top lime 2,700 ft.; hole full of sulphur water 3,043 ft.; drlg. 3,082 ft.

Humble Oil & Ref. Co.'s No. 3 Hendricks-C Lease No. 2, 1,320 ft. S and 330 ft. E of NW cor. Sec. 10, Blk. B-12..... Top lime 2,442 ft.; cem. 6⅝-in. casing 2,448 ft.

Independent O. & G. Co.'s No. 3 McCabe, 990 ft. S and 2,310 ft. W of NE cor. Sec. 36, Blk. B-5, School Land.. Top salt 950 ft.; top lime 2,296 ft.; oil show 2,515 ft.; 1,800 ft. oil in hole; total depth 3,249 ft.; plugged back 3,132 ft.; preparing to shoot.

Independent Oil & Gas Co.'s No. 3-B Hendricks, NW W half SE Sec. 44, Blk. 26..... Drlg. 210 ft.

Magnouia Pet. Co.'s No. 1 Scarborough, 2,310 ft. S and 990 ft. E Sec. 1, Blk. C-22..... Top salt 1,122 ft., gas show 2,840-45 ft.; 160 bbls. oil free from water at 3,020 ft.

Marland Oil Co.'s No. 1 Tobe Morton, SE cor. Sec. 27, Blk. B-12..... Cem. 12½-in. casing 492 ft.; top lime 2,652 ft.; cem. 8¼-in. casing 2,656 ft.; oil show 2,780 ft.; drlg. 2,880 ft.; made 40 bbls.

Marland Oil Co.'s No. 2 Tobe Morton, 990 ft. N and 330 ft. W of SE cor. Sec. 27, Blk. B-12..... Set 12½-in. casing 405 ft.; top salt 1,820 ft.; drlg. 2,390 ft., salt.

Morris & Henshaw's No. 1-B Hendricks, 1,650 ft. N and 990 ft. E of SW cor. Sec. 28, Blk. B-5, School Land... Top pay 3,040 ft.; total depth 3,045 ft.; flows 15 bbls. daily.

Prairie Oil & Gas Co.'s No. 5 Cowdan, 1,320 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. B-12, School Land... Drlg. 2,155 ft.
Prairie O. & G. Co.'s No. 1 Leck, 330 ft. S and 2,310 ft. E of NW cor. Sec. 16, Blk. 74 ... Cem. 12½-in. casing 240 ft.; cem. 8-in. casing 2,663 ft.; spray oil 3,150 ft.; standardizing.
Prairie O. & G. Co.'s No. 2 Leck, 330 ft. S and 2,310 ft. W of NE cor. Sec. 16, Blk. 74 ... Drlg. 2,915 ft.
Prairie O. & G. Co.'s No. 1 Tobe Morton, 330 ft. N and 1,650 ft. W of SW cor. Sec. 27, Blk. B-12 ... Cem. 12½-in. casing 500 ft.; cem. 8¼-in. casing 2,770 ft.; top lime 2,865 ft.; shut down for orders 3,072 ft.; hole full sulphur water at 3,060 ft.
Pure Oil Co.'s No. 1 Hendricks, NE SW Sec. 44, Blk. 26... Drlg. 485 ft.
Shell Pet. Co. et al's No. 2 Lum Daugherty, 2,310 ft. S and 1,650 ft. W of NE Sec. 3, Blk. 74 ... Top lime 2,742 ft.; total depth 3,208 ft.; est. 5,000 bbls. daily salt water; plugged back to 3,170 ft.; shut down for orders.
Simms Oil Co. and Southwest O. P. Co.'s No. 1 George Sealey 2,434 ft. S and 330 ft. W of NE cor. Sec. 50, Blk. F ... Top lime 2,676 ft.; drlg. 2,676 ft.
Southern C. O. P. Co. and Westbrook Thompson's No. 4 Hendricks T-88-B, 330 ft. S and 1,320 ft. E NW cor. Sec. 4, Blk. B-12, Public School Land ... Top lime 2,721 ft.; drlg. on iron 2,806 ft.
Southern C. O. P Co.'s No. 3 Hendricks T-88-D, 1,320 ft. N and W of SE cor. Blk. B-12, Public School Land ... Top lime 2,558 ft.; drlg. 2,913 ft.; flowing 277 bbls. daily; top pay 2,730 ft.
Southern C. O. P. Co. and Westbrook-Thompson's No. 3 Hendricks T-89-C, 2,310 ft. N and W of SE cor. Sec. 35, Blk. B-5. ... Cem. 8¼-in. casing 2,290 ft.; rigging up standard tools; drlg. 2,528 ft.
Southern Crude O. P. Co.'s Hendricks T-89-V, 1,320 ft. S and 330 ft. W of NE cor. Sec. 9, Blk. B-12, School Land ... Location.
Texas Canadian Oil Co.'s No. 1 Kloh-Rumsey, 1,320 ft. N and E of SW cor. Sec. 35, Blk. 46, T.&P.R.R. Sur... Bldg. rig.
Warner-Quinlan Co.'s No. 1 Daugherty, 2,310 ft. S and E of NW cor. Sec. 3, Blk. 74, Public School Land ... Cem. 8¼-in. casing 2,671 ft.; shut down 2,940 ft.

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 39)

Crabtree Drlg. Co.'s No. 1 B. F. Talley, SW NE, Sec. 114, Blk. M-2, B.S.&F. Sur. ... S.O. 2,400 ft; S.D. 2,735 ft.
Constantine et als' No. 1 Dial, 330 ft. S and E of NW cor. W½ NW, Sec. 32, Blk. 25, H.&G.N. Sur. ... Rig.
Danciger et als' No. 1 Shaw, 1,000 ft. N and 330 ft. W SE cor. SW, Sec. 5, Blk. 1, A.C.H.&B. Sur. ... 35,000,000 ft. gas 2,290 ft; show oil 2,610-13 ft; S.D. 2,645 ft.
Danciger et als' No. 1 J. E. Williams, 330 ft. each way from NE cor. NW SW, Sec. 6, Blk. 1, A.C.H.&B. Sur... Drlg. 500 ft.
Danciger et als' No. 1 Sheridan, SE cor. Sec. 184, Blk. B-2, H.&G.N.R.R. Sur. ... Location.
Delmar Oil Co.'s No. 1 P. Foster, NW cor. SW. Sec. 55, Blk. B-2, H.&G.N. Sur. ... S.O.; 4,000,000 ft. gas 2,835-97 ft; T.D. 3,757 ft; to plug back to 2,950 ft. and shoot.
Delmar Oil Co.'s No. 1 Chapman, 330 ft. each way from SE cor. NW, Sec. 10, Blk. 26, H.&G.N. Sur. ... Drlg. 1,928 ft.
Empire G. & P. Co.'s No. 1 A. R. Clay, NE cor. Sec. 185, Blk. B-2 ... Drlg. 780 ft.
Eslick & McKinney's No. 1 Mrs. Hopkins, 330 ft. from NE. E½ NE, Sec. 84, Blk. B-2, H.&G.N. Sur. ... Drlg. 2,360 ft.
Sines & Reiger's, formerly Eslick et als' No. 1 Mrs. J. A. Hopkins, NW cor. W 80 ac. of SW, Sec. 84, Blk. B-2, H.&T.C. Sur. ... Pull 6-in. csg. 3,206 ft.
Gulf Prod. Co.'s No. 4 Holmes-A, 990 ft. N and 330 ft. E of SW cor. W½ SE, Sec. 87, Blk. 3, I.&G.N. R.R. Sur. ... Drlg. 2,980 ft.
Gardner, Collins et als' No. 1 Saunders, 330 ft. each way from NE cor. of S 49 ac. of W 100 ac., Sec. 3, B.&B. Sur. ... 10,000,000 ft. gas 2,526-46 ft.
Magnolia Pet. Co.'s No. 3 W. Harrah, 330 ft. from NE cor. NW, Sec. 150, Blk. 3, I.&G.N. Sur. ... Drlg. 2,100 ft.
Magnolia Pet. Co.'s No. 1 Gething, 330 ft. each way from SE SW, Sec. 14, Blk. A-9, H.&G.N. Sur. ... Drlg. 1,275 ft.
Malone et als' No. 1 Taylor, 990 ft. S and E of NW cor. NW, Sec. 22, Blk. B-2, H.&G.N. Sur. ... Drlg. 250 ft.
Marland Prod. Co.'s No. 1 Brown-Finley, 330 ft. S and W of NE cor. Sec. 32, Blk. B-2, H.&G.N.R.R. Sur. ... Drlg. 525 ft.
McElroy Oil Co.'s No. 2 Bruce Bull, 155 ft. from N line and 240 ft. from W line of E 87.3 ac. of Sec. 3, Blk. B-2, H.&G.N.R.R. Sur. ... S.D 2.564 ft.
McLain Oil Co.'s No. 1 Back, 1,000 ft. from W line and 330 ft. from N line NW, Sec. 24, Blk. 25, H.&G.N. Sur. ... Rig.
Midwest O. & G. Co.'s No. 1 Bower-B, 1,650 ft. from E and 330 ft. from N lines, Sec. 93, Blk. B-2, H.&G. N.R.R. Sur. ... Location.
Nabob Oil Co.'s No. 2 Muse, 660 ft. from W line and 330 ft. from S line SW, Sec. 67, Blk. 25, H.&G. N.R.R. Sur. ... Location.
Parton & Holt's No. 1 Gething, 330 ft. each way from SE cor. NE, Sec. 14, Blk. A-9 ... Drlg. 2,730 ft.
Phillips Pet. Co.'s No. 4 Johns, 330 ft. each way from NE cor. SE SW, Sec. 87, Blk. 3, I.&G.N. Sur. ... Drlg. 2,825 ft.
Phillips Pet. Co.'s No. 5 Johns, 330 ft. N and 990 ft. E of SW cor. SW, Sec. 87, Blk. 3, I.&G.N. Sur. ... Rig.
Phillips Pet. Co.'s No. 1 Bob Olsen, NW cor. S½, Sec. 64, Blk. B-2 ... T.D. 3,239 ft; plugged back to 3,230 ft; shot with 440 qts. at 3,119-3,222 ft; 600 ft. oil and 60 ft. wtr. in hole; C.O. 3,920 ft.
Plains Drlg. Co.'s No. 2 Saunders, 990 ft. from S line and 330 ft. from E line of E½ SE, Sec. 4, Blk. 1, A.C.H.&B. Sur. ... Flowed 2,825 bbls. initially at 2,555-56 ft; now 1,400 bbls. of 41.5 gravity oil.
Pure Oil Co.'s No. 8 Davis, 330 ft. from NW NE, Sec. 86, Blk. 3, I.&G.N.R.R. Sur. ... Show oil lime 3,036 ft; T.D. 3,254 ft. swbd. 125 bbls; T.D. 3,281 ft.
Prairie O. & G. Co.'s No. 2 Reynolds, 330 ft. each way from NW cor. SE, Sec. 61, Blk. 3, I.&G.N. Sur. ... Drlg. 2,965 ft.
Purple Sage Oil Co.'s No. 2 E. B. Johnson ... 2,000,000 ft. gas; 200 ft. oil 2,870 ft; shot with 510 qts. 2,775-2,872 ft; 400 ft. oil; C.O. 2,875 ft.
Republic Prod. Co.'s No. 1 G. H. Saunders, 330 ft. each way from SW cor. E½ NW cor. Sec. 4, Blk. 1, A.C.H.&B. Sur. ... Fish. 2,625 ft.
Schwald et als' No. 1 fee, 330 ft. each way from NE cor. E½ SW, Sec. 1, Blk. 1, A.C.H.&B. Sur. ... Cmtd. 6-in. 2,380 ft.
Skelly Oil Co.'s No. 1 Saunders, 330 ft. from E line, 990 ft. from S line, SW, Sec. 4, Blk. 1, A.C.H.&B. Sur... Fish. 2,475 ft.
Skelly Oil Co.'s No. 3 Saunders, 330 ft. from N line and 990 ft. from W line, SW cor. Sec. 4, Blk. 1, A.C.H.&B. Sur. ... Drlg. 2,620 ft.
Skelly Oil Co.'s No. 4 Saunders, 330 ft. from N line and 990 ft. from E line, SW cor. Sec. 4, Blk. 1, A.C.H.&B. Sur. ... Drlg. 2,700 ft.
St. Clair Oil Co.'s No. 1 Rowe, Sec. 32, Blk. R ... Drlg. 2,315 ft.
St. Clair Oil Co.'s No. 1 L. S. Stockton, SE cor. Sec. 35, W. R. Lee Sur. ... Spudded and S.D.
Southern Pet. Exp. Co.'s No. 2 McConnell, 990 ft. from W line and 330 ft. from S line NW, Sec. 174, Blk. 3, I.&G.N. Sur. ... Drlg. 2,110 ft.
The Texas Co.'s No. 5 A. Chapman, 1,138 ft. from W and 330 ft. from S lines, SE, Sec. 51, Blk. 25, H. &G.N. Sur. ... Rig.
The Texas Co.'s No. 4 H. M. Davis, SE cor. NW, Sec. 86, Blk. 3, I.&G.N. Sur. ... C.O. 3,240 ft.
The Texas Co.'s No. 5 Davis, 330 ft. S and W of NE cor. NW, Sec. 86, Blk. 3, I.&G.N. Sur. ... Drlg. 2,785 ft.
The Texas Co.'s No. 8 Saunders, 895 ft. N and 2,060 ft. E of SW cor. Sec. 3, B.&B. Sur. ... Drlg. 2,625 ft.
The Texas Co.'s No. 9 Saunders, 330 ft. S and 3,016 ft. E of NW cor. Sec. 1, Eustis Sur. ... Fish. 2,460 ft.
The Texas Co.'s No. 7 Saunders, 990 ft. from S line and 330 ft. from W line W½ SE cor. Sec. 4, Blk. 1, A.C.H.&B. Sur. ... Flowed 660 bbls. fluid 30% wtr. at 2,650-61 ft.
Travis et als' No. 1 J. S. Morse, SE NW SW, Sec. 68, Blk. 25, H.&G.N. Sur. ... 30,000,000 ft. gas 2,592-2,616 ft; light spray oil 2,740-45 ft; to deepen.
Wilcox-Pampa Oil Co.'s No. 30 Wooley & Reynolds, NW SE NW, Sec. 61, Blk. 3 ... Flows 147 bbls. from G.W. at 3,038-3,100 ft.
United Eight O. & T. Co.'s No. 1 E. B. Clay, SE cor. W½ SW, Sec. 177, Blk. B-2 ... Swabs 7½ bbls. per hr. 3,251 ft; placing lead plug to shut off wtr. and putting on gas lift.
Wilcox-Pampa Oil Co.'s No. 31 Worley Reynolds, 330 ft. N and E SW cor. SE SW, Sec. 61, Blk. 3, I.&G.N. S.D. 2,330 ft.

HALL COUNTY

Rio Bravo Oil Co.'s No. 1 Hughes est., 950 ft. from N line, 150 ft. from E line, Sec. 39, Blk. H, I. A. Stephens Sur. ... Set 6-in. 3,500 ft; drlg. 4,420 ft.

HOCKLEY COUNTY

World Oil Co.'s No. 1 Ellwood, 320 ft. from N and W lines, League 7, Wilbarger County school lands; elevation 3,363 ft.; contract depth 5,000 ft. ... S.D. 1,455 ft.

HARTLEY COUNTY

Amarillo Oil Co.'s No. 9 Lee Bivins "A," C NW, Sec. 6, Blk. 21 ... 15,000,000 ft. gas 3,300-35 ft; T.D. 3,601 ft; to deepen.
Canadian River Gas Co.'s No. 10 Burns-A, 660 ft. N. and 660 ft. E. Sec. 18, Blk. 2, G.&M. Sur. ... Rig.

HUTCHINSON COUNTY

Antelope Creek Oil Co.'s No. 3 Sanford, 330 ft. from N line and 330 ft. from W line of E½ S 160 ac. of Sec. 82, Blk. 46, H.&T.C. Sur. ... Drlg. 2,508 ft.
Dunnigan et als' No. 1 C. W. Hugenbyhl, 330 ft. from S line and 33 0ft. from E line, N½, Sec. 4, Blk. T. W.N.G.R.R. Sur. ... Run. 8-in. csg. 1,135 ft.
Oil Operators Trust Co. and Marland's No. 2 J. M. Stanford B, Sec. 82, Blk. 46, H.&T.C. Sur. ... S.D. 3,039 ft.
Phillips Pet. Co.'s No. 2 Jasper, 980 ft. from S line and 660 ft. from E line SE, Sec. 23, Blk. M-23, T.C. R.R. Sur. ... Location.
Phillips Pet. Co.'s No. 4 Johnson Bros.-Florence, 330 ft. N and E of SW cor. E½, Mary Whitely Sur. ... Drlg. 415 ft.
Phillips Pet. Co.'s No. 3 Johnson-Pulaski, 330 ft. N and W of SE cor. W½, Mary Whitely Sur. ... Drlg. 2,080 ft.
Phillips Pet. Co.'s No. 5 Johnson-Barnum, 990 ft. N and 330 ft. W SE cor. E 80 ac. of S 160 ac. of N 400 ac., Sec. 64, Blk. 46, H.&T.C.R.R. Sur. ... Spud.
Phillips Pet. Co.'s No. 1 Sanford-Garford, 330 ft. N and E of SW cor. N 40 ac. of E 80 ac. of S 160 ac. of S 320 ac., Sec. 77, Blk. 46, H.&T.C.R.R. Sur. ... Fish. 2,920 ft.
Phillips Pet. Co.'s No. 3 Sanford-Garland, 330 ft. N and E of SW cor. Sec. 77, Blk. 46, H.&T.C. Sur. ... Rig.
Phillips Pet. Co.'s No. 15 Whittenburg, Sec. 63, Blk. 46, H.&T.C. Sur. ... Rig.
Phillips Pet. Co.'s No. 16 Whittenburg, Sec. 63, Blk. 46, H.&T.C. Sur. ... Rig.
Timms et als' No. 1 Moore, 330 ft. N and E of SW cor. S 40 ac. of NW, Sec. 21, Blk. M-21, T.C.R.R. Sur. Rig.
Wendell et als' No. 1 Johnson Bros., Sec. 1, Blk. X03 ... Set 10-in. csg. 2,035 ft; S.D.

KING COUNTY

The Texas Co.'s No. 1 J. H. Johnson ... S.D. 4,300 ft.
Huff Oil Co.'s No. 1 Martin, 1,320 ft. from N line and 1,320 ft. from E line Sec. 171, Blk. F, H.&T.C. Sur. Rigging.

LAMB COUNTY

Dan Freel et als' No. 1 Ellwood, CWL, Sec. 9, Blk. T. T. A. Thompson Sur. ... Spudded and S.D.

LIPSCOMB COUNTY

Brown et als' No. 1 Box T. Ranch, SW NE, Sec. 612, H.&T.C. Sur. ... S.D. 2,400 ft.
Ruby Oil Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ... S.D. 4,433 ft. for 5-in. csg.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles ranch ... Small show oil 1,133-40 ft; sand; S.D. 4,000 ft.

MOORE COUNTY

Barnsdall Oil Corp.'s No. 1 L. R. Hagy, NW cor. of Thomas Ross Sur. ... 20,000,000 ft. gas 3,205 ft; T.D. 3,234 ft; 900 ft. oil 3,226-34 ft; swbd. twice in one day and made 52 bbls.; swbng. 15 bbls; drlg. 3,254 ft.
Canadian Gas Co.'s No. 1 Kilgore-A, 2,716 ft. S and 2,695 ft. W of NE cor. Sec. 1, Eustis Sur. ... Drlg. 300 ft.
Devonian Oil Co.'s No. 1 J. T. Sneed, Jr., 2,235 ft. from E and 330 ft. from S lines, S 160 ac., N 320 ac., of Matilda Robinson Sur. ... Fish. 2,980 ft.
Dixie Creek Oil Co.'s No. 1-A Sneed, Jr., 330 ft. N and W of SE cor. E½, Sec. 65, Blk. 3, G.M. Sur. ... T.D. 3,197 ft; S.D.
Dixie Creek Oil Co.'s No. 4-A Sneed, Jr., 330 ft. S and W of NE cor. E½, Sec. 65, Blk. 3 ... 10,000,000 ft. gas 2,835-55 ft; 50 ft. oil 3,304-05 ft; H.F.W. 3,-354 ft; P.B. to 3,336 ft.
Fritch O. & G. Co.'s No. 1 Lee Burns, C NE 40 ac. N 160 ac., Sec. 4, Geo. Mahan Sur. ... Spudded and S.D.
Phillips Pet. Co.'s No. 1 Burnett, 330 ft. each way from NE cor. NE, Sec. 192, Blk. 3-T, T.&N.O. Sur. ... Drlg. 1,560 ft.

MOTLEY COUNTY

Expltn. Co.'s No. 1 Tillson ... Drlg. 1,550 ft.
Expltn. Co.'s No. 2 Matador Land & Cattle Co., C SW, Sec. 37, John Gibson Sur. ... U.R. 6-in. csg. 4,700 ft.

ROBERTS COUNTY

Big Bend Oil Co.'s No. 1 Ledrick, Sec. 7, Blk. 5-A ... Formerly abd. at 5,240 ft; small show 36 gravity oil 5,288-91 ft; show oil brown sand 5,710-12 ft; fish. 5,820 ft.

WHEELER COUNTY

Angus et als' No. 2 Morgan, C E½ NW NE, Sec. 93, Blk. 17, H.&G.N. Sur. ... S.D. 1,175 ft. for pipe.
Arnold Oil Co. et als' No. 1 Ritchey, 420 ft. from E and 460 ft. from S lines of NW cor. Sec. 5, Blk. 24, H.&G.N. Sur. ... Drlg. 190 ft.
Byrens et als' No. 1 Johnson, SW cor. NE, Sec. 88, Blk. A-5, H.&G.N. Sur. ... S.D. 2,800 ft.
Fain McGaha and Humble's No. 1 Noel, 330 ft. each way from NE cor. S½ SE, Sec. 54, Blk. 24, H.& G.N. Sur. ... Drlg. 210 ft.
Hartsell et als' No. 1 Burchman, C NW SE, Sec. 91, Blk. 17, H.&G.N. Sur. ... Drlg. 1,740 ft.
Johnson & Co.'s No. 1 Purcell, 430 ft. from N line and 570 ft. from W line NE, Sec. 50, Blk. 17, H.&G.N. Sur. Drlg. 920 ft.
Lone Star Co.'s No. 1 Hicks, C SW NE, Sec. 52, Blk. 17, H.&G.N. Sur. ... Rig.
Lone Star Gas Co.'s No. 3 Jones, C NW NE, Sec. 1, Blk. 25, H.&G.N. Sur. ... Drlg. 635 ft.
Lone Star Co.'s No. 1 Shelton, C NE SE, Sec. 22, Blk. 24, H.&G.N. Sur. ... Drlg. 1,280 ft.
Martin & Dubous' No. 1 Close, 330 ft. S and 660 ft. W NE cor. NE SE, Sec. 82, Blk. 23, H.&G.N. Sur. ... Drlg. 1,380 ft.
L. W. Rook's No. 1 M. Nelson, C SW NE, Sec. 5, Blk. 24, H.&G.N. Sur. ... Drlg. 1,980 ft.
J. D. Whittington et als' No. 3 Williams-Laycock, 330 ft. N and E of SW cor. Sec. 9, Blk. 27, H. &G.N.R.R. Sur. ... Drlg. 1,580 ft.
L. W. Rook's No. 2 A. Smock, C SW SE, Sec. 5, Blk. 24, H.&G.N. Sur. ... Rig.
Wisch Kamper's No. 1 Adamson, C NE SE, Sec. 50, Blk. 17, H.&G.N.R.R. Sur. ... Location.
Wisch Kamper's No. 1 Parsons, C NW NW, Sec. 53, Blk. 23, H.&G.N. Sur. ... C.O. 1,950 ft.
Wisch Kamper's No. 2 Wisch-Kamper, 175 ft. N and 164 ft. E of SW cor. NE SW, Sec. 86, Blk. 23, H. &G.N. Sur. ... S.D. 485 ft.
Upham Gas Co.'s No. 1 Raybo, C S½ NW NW, Sec. 105, Blk. 23, H.&G.N. Sur. ... Rig.

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DETROIT

OAKITE PRODUCTS MEN HOLD SALES CONFERENCE

Mid-Continent representatives of Oakite Products, Inc., who held a conference January 12 in the Mayo Hotel, Tulsa. Back row: C. L. Fischer, St. Louis, Mo.; J. E. Arnold, Wichita, Kans.; A. H. Green, Kansas City, Mo.; H. J. Steeb, St. Louis; R. Henry, Tulsa. Front row: W. B. Mix, Dallas, Tex.; Fred A. Aston, general sales manager, New York; V. D. Smith, Oklahoma City, Okla.; J. W. Byrnes, Houston, Tex.

Sales and technical cleaning problems were discussed by Mid-Continent representatives of Oakite Products, Inc., New York, at a conference held January 12 in the Mayo Hotel, Tulsa. Particular stress was laid on the use of Oakite materials in the oil industry. A new territorial arrangement was worked out for Oklahoma. Under the plan adopted three men will cover the State, as the volume of business indicates that this number will be required to provide adequate service.

PIPE ORDER PLACED FOR CALIFORNIA LINE

By B. E. V. Luty

PITTSBURGH, Pa., Jan. 21. — The week in the tubular goods trade is characterized by the placing of a large amount of line pipe, which has been active at intervals since late last June, keeping producers very well supplied with orders. Two lines have been placed, one a gas line involving about 44,000 tons, the other an oil line involving about 32,000 tons.

The gas line was placed by the Pacific Gas & Electric Co., 150 miles of 20-inch and 50 miles of 16-inch, with the A. O. Smith Corp., Milwaukee, Wis., for electrically welded pipe.

The oil line was placed by the Prairie Pipe Line Co., 300 miles of 8-inch and 200 miles of 12-inch, with the National Tube Co. and the Central Tube Co., Pittsburgh. This is for a second oil line to run from Panova, Okla., to Griffith, Ind.

Since last report, two definite statements have been made by James A. Farrell, president of the United States Steel Corp., along the line that the National Tube Co. will start promptly on the improvements at the McKeesport plant, near Pittsburgh, referred to a week ago as being projected. A large and complete plant for the manufacture of seamless tubing will be built, to supplement the welded pipe mill at McKeesport, one of the largest in the world. The Steel corporation has been making seamless at three other plants, Ellwood City, Pa., Lorain, Ohio, and Gary, Ind., but the plant at McKeesport will doubtless be larger than any of these. Mr. Farrell has stated that the Bessemer steel making department at McKeesport will have fuller employment in the future, and as Bessemer steel would not be used for seamless pipe it may be inferred that Bessemer steel from that plant will be exchanged at other Steel corporation plants for open-hearth steel, though it is understood that the new seamless plant will also contain an open-hearth steel making department.

The Steel corporation's statement of unfilled obligations December 31 did not make a particularly good showing. There was an increase of 303,712 tons, the amount by which new bookings, including contracts, exceeded the month's shipments, but December has usually shown a larger increase. The last month of a quarter is generally swelled by quarterly contracts in various lines, and usually contracting runs heavier for the first quarter than for other quarters. Less favorable still is the showing for the quarter, for with a small increase in October and a larger decrease in November the net increase for the quarter in unfilled obligations is only 278,344 tons, against 824,761 tons in the fourth quarter of 1927. Fourth quarter bookings are regularly swelled by the annual rail buying movement, chiefly for delivery during the first half of the new year, while rail shipments are relatively light in the quarter. This time the seasonal rail buying movement was relatively light.

The official report of steel ingot production in December shows a producing rate at 85 per cent of capacity, or fully equal to the more conservative trade estimates. A total of about 50,500,000 gross tons as the steel ingot production of the year is now indicated to be shown by the final annual report, due in April or May, about 16 per cent over 1927 production and 8 per cent over production in 1926, formerly the record year.

The fore part of January has not been marked by much fresh steel buying activity, but specifications have been very heavy and mills are running better than in December, steel production being at above 85 per cent, say 87 to 88 per cent. Some of the strip mills are nearly a month behindhand in deliveries and merchant bar production is at close to capacity. Sheet and tin mills are running nearly full. Pipe mills remain at about 65 per cent and seamless tube mills at 75 to 80 per cent.

CHAIRMAN OF COMMISSION

Commissioner Edgar A. McCulloch, former chief justice of the Supreme Court of Arkansas, has become chairman of the Federal Trade Commission, succeeding Chairman Abram F. Myers, whose resignation has become effective. The new chairman will serve under the rule of rotation providing each commissioner serve one year as chairman. Since last March he has presided as commissioner in charge of all hearings in the investigation of power and gas utilities and will continue to act in that capacity.

Costs less per foot drilled
Costs less per barrel pumped
Costs less per H. P. generated
Costs less per year of service

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O AND G BELTS

Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

CROOKED HOLE SURVEYING

The question of locating the direction of crooked drill holes is quite important for the oil industry. I know that several devices have been designed for diamond drill holes as applied to mining. However, I do not believe that any of these designs could be applied to oil wells. Are there any publications upon the subject, or devices for measuring the paths of crooked oil wells?—E. U. V. B.

The method developed by Alexander Anderson, consulting engineer, of Fullerton, Calif., is the one most extensively used in this country. This method has been described in several articles in The Oil and Gas Journal. H. B. Goodrich, consulting geologist of Tulsa, has compiled a list of over 60 references upon this subject. His list includes many references to American and European methods of surveying deep bore holes and oil wells. Miss Florence W. Lundell, technical librarian, Tulsa Public Library, has also prepared a complete bibliography upon the subject which can be had free of charge upon application addressed to her. Your attention is also called to discussions of the subject in the Field Problems page of The Oil and Gas Journal for July 26, 1928; September 27, 1928; October 11, 1928; November 10, 1928; November 17, 1928, and November 24, 1928.

Although there is an extensive literature upon the surveying of crooked holes, you can probably find what you want in the Field Problems answers referred to and in The Oil and Gas Journal, September 9, 1926, "Underground Surveying of Deepest Well," by Alexander Anderson; August 23, 1928, "Crooked Holes Discussed by Engineers," by R. Van A. Mills, and "Crooked Holes Cost Industry Vast Sum," by J. L. Dwyer; and November 15, 1928, "Crooked Hole Problems Being Studied," by H. B. Goodrich.

BOOKS FOR THE BEGINNER

I would appreciate a list of such books as will serve as an outline of the engineering principles in petroleum production methods, drilling, plant construction, etc. What I have in mind would be a study of the textbooks which serve petroleum engineers, or such as are used by the universities teaching petroleum engineering. In a recent article in The Oil and Gas Journal I see that the majority of the faculties of such universities advocate the young engineer having as large an amount of practical experience in the field as possible, and it occurs to me that men already serving the petroleum industry, but not having had the opportunity of studying for the B.S. degree, should be able to find textbooks which would give them the equivalent of this work at home. How much better it would be if some of the leading universities, which include petroleum engineering in their curricula, could arrange to teach this subject by correspondence. I am sure the response to such a course would be gratifying.

If you can, therefore, furnish a list of the books which should be in the library of every present or prospective petroleum engineer it will be greatly appreciated.—H. H.

Your suggestion that correspondence courses upon petroleum engineering would be most valuable to field men already serving the industry is a good one. There are good correspondence courses in petroleum engineering. A list of some of them is being sent to you by this department. While an experienced field man will know a great deal more about certain phases of petroleum engineering than these courses can teach him, the fundamental training in mathematics, physics, chemistry and mechanics should be invaluable. Training in the fundamental sciences is necessary for a good engineering education.

There are a great many good books on petroleum engineering, but no one of them is complete in itself. The subject is so broad that it would take an extensive library to begin to cover it. With these things in mind it is suggested that you start forming a small reference library of your own to use in connection with your reading study. To start this it is suggested that you obtain as many of the United States Bureau of Mines publications on petroleum engineering subjects as possible. You should send to the United States Bureau of Mines Station at Bartlesville, Okla., for a list of these publications and apply for the various papers and bulletins in which you are interested, either through the Director of the United States Bureau of Mines, Washington, D. C., or through the Superintendent of Documents, Government Printing Office, Washington, D. C. In this way you can acquire a valuable library at only nominal cost.

A few of the best Bureau of Mines publications for the student of petroleum engineering are:

"Some Principles Governing the Production of Oil Wells," by Carl H. Beal and J. O. Lewis; "Underground Conditions in Oil Fields," by A. W. Ambrose; "Methods for Increasing the Recovery From Oil Sands," by J. O. Lewis; "Surface Machinery and Methods for Oil-Well Pumping," by H. C. George, and "Methods of Shutting Off Water in Oil Wells," by F. B. Tough.

A valuable aid to your study of petroleum engineering would be to read the articles and reprinted papers on the different phases of this subject which appear regularly in The Oil and Gas Journal. The weekly page of Field Problems and Their Solution should be especially useful in this work. It would be a good plan to file these pages for future reference.

You are also advised to obtain a complete set of the lists of references to different subjects in petroleum engineering and production that have been prepared by Miss Florence W. Lundell, technical librarian, Tulsa Public Library, Tulsa. These are obtainable without cost and will tell you where to look for information upon any of the subjects covered.

Among the good books which should be useful to you are the following:

"Petroleum Production Engineering," by Lester C. Uren; "Deep Well Drilling," by Walter H. Jeffrey; "Petroleum Production Methods," by John R. Suman; and "Handbook of the Petroleum Industry," by David T. Day. To these you should add catalogs and handbooks of various manufacturers.

PROLONGING SUCKER-ROD LIFE

Can you tell me the principal causes for sucker-rod failures and the best ways to prolong the life of sucker rods? Where do most breaks occur in sucker rods?—L. S. R.

This subject is now being studied by a large number of equipment manufacturers, supply houses and oil companies and considerable new information upon rod failures is being brought out.

Among the common causes for sucker-rod failures are:

1. Faulty materials.
2. Metal fatigue.
3. Improper care and use.
4. Improper design.
5. Excessive friction and wear in crooked holes.
6. Incorrect pumping speeds.
7. Excessive vibration and snap.
8. Incorrect size of rods for pumping loads.
9. Use of bent or kinked rods.
10. Improper counterbalancing.
11. Tight working barrels.
12. Getting dirt and grit on pins and boxes so joint cannot be made up snugly.

Among the methods of prolonging the life of sucker rods are:

1. Use of good materials and proper design and construction.
2. Proper heat treatment.
3. Use of correct size of rods for loads imposed.
4. Use of combination rods.
5. Use of long slow stroke instead of short rapid stroke.
6. Keeping joints free from dirt and grit.
7. Encouraging proper setting up of joints.
8. Avoiding bending or kinking rods in any way.
9. Using no bent or kinked rods.
10. Use of rod hangers in derricks. Do not pull rods in and out under derrick girts.
11. Seeing that pump plunger is not unnecessarily tight.
12. Use of rod guides in crooked holes to eliminate unnecessary friction and wear.
13. In general, the reverse of the conditions that cause rod failures.

Most sucker-rod failures occur in the first 1,500 feet in a well 4,000 or 5,000 feet deep, and there is a rather general opinion that most of the breaks occur in or close to the joints. It must be recognized, however, that breaks occur anywhere in a sucker rod and that a predominant location of rod breaks on a certain property may be only suggestive of the cause for the breaks on that property. In one case of record an operator reports that 90 per cent of his rod breaks occur in the joints, either pin breaks or in the rods about 4 inches from the joints. This would indicate some characteristic weakness or some characteristic cause of failure at those points.

COST OF A WELL

Will you kindly advise me as to the approximate total cost of drilling and equipping a well for gas production to the depth of from 1,500 to 1,650 feet in Woodson County, Kansas, the location being 6 miles west and 2 miles south of Yates Center, the county seat, where few wells have already been drilled?

With gas yielding 8 to 10 cents per 1,000 cubic feet to the producer, would you consider a well producing 400,000 feet per day a profitable investment, taking into consideration the probability that more wells of the same average production could be secured?

In case you are unfamiliar with drilling costs in the locality referred to an approximate cost would be perfectly satisfactory. Am enclosing postage for reply and thank you in advance for the courtesy.—R. G. E. D.

Your question was submitted to a man familiar with conditions in the territory mentioned and his reply follows:

"Drilling in the Woodson County area should be contracted at about $1.75 a foot on the basis of a total depth of wells of 1,500 to 1,600 feet. The equipment necessary to complete a gas well of course include tubing, packer and the use of casing which is reclaimed at the time the well is completed.

"The price paid for gas in the field in the area referred to is 8 cents per 1,000 cubic feet. Your question as to whether a well producing 400,000 feet a day would be a profitable investment is rather a difficult one to answer. Obviously if the well produced 400,000 feet a day for a sufficient length of time it would be very profitable, but if it were to water in a short time or failed to continue to produce for some other reason it would then equally apparently be unprofitable.

"The Union Gas Corp. has a pipe line running for a distance of 8 miles due west from Yates Center to Section 9-23-14, and would purchase any gas from commercial wells in the area adjacent to this line."

WEIGHING A PUMPING WELL

Can you tell me whether any satisfactory apparatus for weighing pumping oil wells is being manufactured and whether the apparatus is easy to use? If such a thing is being made by any of the equipment concerns I would like to know which one.—W. A. S.

This department has no information upon any equipment manufactured specially for weighing pumping wells. Several oil companies are using weight indicators on wire line beam hangers as part of their equipment for weighing the rods and fluid being lifted in pumping wells. Different types of recording devices are used with these weight indicators some of them giving graphic charts resembling the indicator cards used on either steam or internal combustion engines.

An electrical dynamometer has been described recently by F. W. Lake in a paper presented before the recent A.P.I. meetings in Chicago and published in The Oil and Gas Journal of December 13, 1928. The most serious objection to this device is that the hookups are cumbersome and in their present stage of development can not be conveniently or quickly attached to pumping wells.

One company operating a great number of pumping wells endeavors to avoid these cumbersome methods of weighing wells by timing with a stop watch the up strokes and down strokes and then counterbalancing until these are equalized as nearly as possible.

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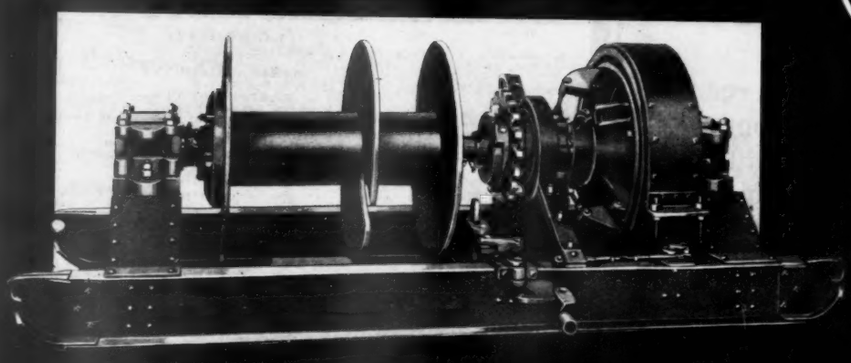

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Construction was started April 21. Plant started making gasoline (averaging now 35,000 gallons a day) on June 7, 47 days only being required to bring this modern unit into being.

The cost to the owner is not to be measured by the contract price. A highly efficient plant that gets under way the day it is promised for *pays the owner;* one that runs over schedule, *the owner pays for.*

The J. A. Campbell Company sets the day and then builds the plant that starts producing on that day. Their record on scheduled construction is unparalleled.

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Natural Gas Engineers
CONSULTING DESIGNING CONSTRUCTING
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LONG BEACH, CAL.
MID-CONTINENT AGENCY STEARNS-ROGER MFG. CO., DENVER

Originators of Oil-Froth Absorbers

KANSAS WILDCATS

(Continued from Page 44)

Derby Oil Co.-Empire Oil & Ref. Co.'s No. 1 Krause, NW cor. SW SW Sec. 17-14-19w ..... Cementing core 3,829 ft.
Phillips Pet. Co.'s No. 1 Brull, C NW Sec. 34-14-17w ..... Drlg. 1,760 ft.
Moncrief et al's No. 1 Johnson, SW cor. NE Sec. 9-13-19w ..... Rig.
John Brown's No. 1 Gestner, SE cor. SW NE Sec. 13-13-18w ..... Drlg. 1,350 ft.
Empire Oil & Ref. Co.'s No. 1 Wann, NE cor. NE Sec. 31-12-19w ..... Underreaming 3,515 ft.
Mariand Oil Co.'s No. 1 Vine, SW cor. SW SE Sec. 27-11-19w ..... Drlg. 3,760 ft.
Davis & Hazlett's No. 1 Wieland, NE cor. NE Sec. 1-13-16w ..... Drlg. 1,125 ft.

EDWARDS COUNTY

Amerada & Wilcox's No. 1 Teansil, C NW SW Sec. 32-25-19w ..... Drlg. 4,050 ft.
British American Oil Co.'s No. 1 McCarty, NE cor. NW Sec. 31-25-17w ..... Spudded and shut down.

GEARY COUNTY

Wright et al's No. 1 Younker, NW cor. NE Sec. 17-11-5 .. Shut down 1,200 ft.

GRAHAM COUNTY

Gulf Coast Oil Co.'s No. 1 Johnson, C S half Sec. 27-8-25w ..... Shut down 2,450 ft.

HARPER COUNTY

Amerada Pet. Corp.'s No. 1 Mendiville, C E SE Sec. 24-34-6w ..... Cleaning out 5,353 ft.

HARVEY COUNTY

R. S. Austin's No. 1 Nieman, SW cor. SW Sec. 21-24-2 .... Drlg. 2,920 ft.
Mrs. Gay et al's No. 1 Grove, C NW NE NW Sec. 29-23-1w ..... Rig.
Helmerich & Payne's No. 1 Lindamond, C SW NE SW Sec. 2-22-1e ..... Spudded and shut down.

JEFFERSON COUNTY

Wichiet Oil Co.'s No. 1 Simpson, NW cor. SW SW Sec. 19-10-17 ..... Rigged up and shut down.

JACKSON COUNTY

Garvin & Morton's No. 1 Lutes, SW cor. NW NW Sec. 27-7-15 ..... Shut down 940 ft.

LANE COUNTY

Blankenship Pet. Co.'s No. 1 Schaeffer, NE cor. NE Sec. 24-16-28w ..... Spudded and shut down.

MARSHALL COUNTY

Irwin et al's No. 1 Cooper, NE cor NW Sec. 10-3-7 ..... Shut down 600 ft.

MARION COUNTY

Empire Oil & Ref. Co.'s No. 1 Burhart, SE cor. NE NE Sec. 11-20-3 ..... Shut down 2,400 ft.
J. E. Hauna's No. 1 Pankratz, NE cor. NE SW Sec. 12-20-3 ..... Rig.
A. E. Meyers' No. 1 Papp, SW cor. SW NE Sec. 10-18-2 .. Spudded.

MEADE COUNTY

Blackwell O. & G. Co.'s No. 1 Beyer, SE cor. NW SE Sec. 9-33-28w ..... 500,000 ft. gas and 2 bailers water total depth 4,356 ft.

McPHERSON COUNTY

Ted Washabaugh's No. 1 Vosshell, NE cor. NE Sec. 9-21-3w ..... Shut down 2,100 ft.
Lariaux et al's No. 1 Martinson, NE cor. Sec. 9-19-3w ..... Rig.
McPherson Gas Co.'s No. 1 Stein, SW cor. NE SW Sec. 17-18-1w ..... Drlg. 3,083 ft.
McPherson Gas Co.'s No. 1 Gustafson, C NE Sec. 9-17-2w ..... Shut down 3,597 ft.
W. C. Newman's No. 1 Diepenbrock, NW cor. NE Sec. 2-17-1w ..... Drlg. 3,462 ft.
McPherson Gas Co.'s No. 1 Wedell, C SW Sec. 12-20-2w ..... 5,000,000 ft. gas 2,983 ft. casing
Vickers Pet. Co.'s No. 1 Wedell, C SW Sec. 12-20-2w ..... Rig.
Mid-Kansas Oil & Gas Co.'s No. 1 Yoder, C NW SW Sec. 8-20-4w ..... Drlg. 1,419 ft.
Mariland Prod. Co.'s No. 1 Wilkering, C SW SW Sec. 9-21-1w ..... Drlg. 1,250 ft.

NESS COUNTY

Barnsdall Oil Co.'s No. 1 Lauk, C SW Sec. 35-18-21w .... Casing 600 ft.

OSBORNE COUNTY

L. D. Jarvis' No. 1 Jellison, SE cor. SE Sec. 13-10-15w .... Spudded and shut down.

OTTAWA COUNTY

Anderson et al's No. 1 Bank, NE cor. NW Sec. 28-10-2w .. Shut down 2,820 ft.

PAWNEE COUNTY

F. C. Troupe's No. 1 Lovett, CEL NE NE Sec. 31-21-16w .. Shut down 1,560 ft.

PHILLIPS COUNTY

Watsonia Oil Co.'s No. 1 Marklein, NE cor. SW Sec. 21-3-19w ..... Shut down 3,015 ft.
British American Oil Co.'s No. 1 Weinman, C SW SW Sec. 34-2-19w ..... Rig.

RENO COUNTY

Austin Drilling Co.'s No. 1 Strickley, SW cor. NW Sec. 17-25-5w ..... Rig.

RICE COUNTY

Allison & Fitzwilliams' No. 1 Poland, NE cor. SW NE Sec. 36-19-8w ..... Cellar.
Higgins & Stembubble's No. 1 Shurr, NE cor. SW Sec. 21-20-10w ..... Spudded and shut down.

ROOKS COUNTY

Prairie Oil & Gas Co.'s No. 1 Sandberg, C SW Sec. 20-9-18w ..... Drlg. 820 ft.
Krueger et al's No. 1 Poore, NE cor. NE Sec. 14-8-16w .... Drlg. 3,510 ft.
Burford & Brimm's No. 1 Toxa, NE cor. SW SE Sec. 22-19-17w ..... Spudded and shut down.
Skelly & Mid-West's No. 1 Jones, SW cor. NE NW Sec. 28-7-16w ..... Shut down 3,485 ft.

RUSH COUNTY

Phillips Pet. Co.'s No. 1 Legleiter, NE cor. NW SE Sec. 10-16-18w ..... Drlg. 450 ft.
Sinclair Oil & Gas Co.'s No. 1 Berching, NW cor. NE NW Sec. 9-16-16w ..... Fishing 3,474 ft.
Danciger Oil & Ref. Co.'s No. 1 Poland, NE cor. SW NE Sec. 17-19-17w ..... Shut down 530 ft.

RUSSELL COUNTY

Joe Liggett's No. 1 Maier, SE cor. NE SE Sec. 8-11-15w .. Top Oswald 3,016 ft.; show oil and water, drlg. 3,280 ft.

SALINE COUNTY

M. Esty et al's No. 1 Peterson, C NE Sec. 6-16-5w ..... Spudded and shut down.
Boyle et al's No. 1 Miller, SW cor. SE Sec. 21-16-1w ..... Cleaning out 2,615 ft.
Nathan Jones et al's No. 1 Robertson, NW cor SW Sec. 27-14-2w ..... Underreaming 2,847 ft.

SEDGWICK COUNTY

Bu-Vi-Bar et al's No. 1 Roberts, SE cor. SW Sec. 1-26-2w ..... Rig.
E. B. Shawver et al's No. 1 Broels, NE cor. SW Sec. 5-26-2e ..... Drlg. 2,065 ft.
Barnsdall Oil Co.'s No. 1 Means, NW cor. SW Sec. 34-27-2 ..... Drlg. 2,200 ft.
Lewis et al's No. 1 Taylor, NW cor. NE Sec. 23-27-2 ..... Drlg. 1,016 ft.
J. H. Tatlock et al's No. 1 Goeldner, NW cor. NE Sec. 6-29-2e ..... Shut down 2,200 ft.
Hyser et al's No. 1 Stroot, SW cor. NW Sec. 8-26-2w ..... Drlg. 600 ft.
Magiason et al's No. 1 Buckles, NW cor. SE Sec. 3-28-1w .. Shut down 250 ft.
McCulloch Oil Co.'s No. 1 John, C NE SW NE Sec. 24-29-1e ..... Fishing 1,804 ft.
Morgan & Tilley's No. 1 Fitzgerald, NW cor. NE Sec. 5-26-1w ..... Rig.
Barnsdall Oil Co.'s No. 1 Faber, SW cor. NW Sec. 6-27-1w ..... Cleaning out 3,010 ft.
Bu-Vi-Bar Pet. Co.'s No. 1 Steel, SE cor. SE Sec. 1-26-2w .. Underreaming 3,310 ft.
Connell & Slick's No. 1 Cross, NE cor. NE Sec. 27-25-1w .. Drlg. 2,975 ft.
VanZant & Mason's No. 1 Fox, C NW SW Sec. 19-25-1w .. Drlg. 2,990 ft.
Barnsdall Oil Co.'s No. 1 Samuels, NE cor. NW Sec. 24-25-1 ..... Drlg. 2,610 ft.
Mariand Prod. Co.'s No. 1 Goodrich, SW cor. NE SW Sec. 16-25-1 ..... Flowed 2,120 bbls. in 12 hours; pinched in.
Shell Pet. Corp.'s No. 1 Lygrisse, SE cor. NE Sec. 15-26-2e ..... Spudded.

SHERMAN COUNTY

A. L. Henson et al's No. 1 Murry, NE cor. SE NW Sec. 22-7-40w ..... Shut down 3,035 ft.

STEVENS COUNTY

Trees Oil Co.'s No. 1 Thompson, C NE SW Sec. 3-35-38w .. Casing trouble 600 ft.

(Continued on Page 111)

W. Sidwell et al's No. 1 Kelly, SW cor. NE Sec. 16-24-33w ..... Shut down 1,218 ft.
McKenna et al's No. 1 Haun, SE cor. NE Sec. 10-33-33w.. Drlg. 1,620 ft.

SMITH COUNTY

Mid-Kansas Oil & Gas Co.'s No. 1 Unknown, NE cor. NE Sec. 4-2-13w ..... Rig.

SUMNER COUNTY

McCulloch Oil Co.'s No. 1 Teettle, SW cor. NE Sec. 29-34-1w ..... Drlg. 4,479 ft.
Gypsy Oil Co.'s No. 1 Williams, NW SE SW Sec. 16-32-2w ..... Fishing 4,400 ft.
Helmerich & Payne's No. 1 Warlick, SE cor. NE Sec. 8-34-2 ..... Dry and abandoned 3,854 ft.
Otstot et al's No. 1 Barlow, SE cor. SE Sec. 22-35-3w.... Plugging back to 4,150 ft.
Otstot et al's No. 1 Volker, NW cor. NE Sec. 9-35-1..... Rig abandoned.
Davidson and others' No. 1 Strickland, SW cor. SE Sec. 12-35-1w ..... Rig.

TREGO COUNTY

Central Commercial Oil Co.'s No. 1 Ellis, NE cor. SW NE Sec. 20-13-21w ..... Drlg. 3,080 ft.

WASHINGTON COUNTY

McCool & Vincent's No. 1 Linn, NW cor. NE Sec. 27-4-3... Rig.

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 42)

McLAIN COUNTY

Empire Oil & Ref. Co.'s No. 1 Bonner, SE cor. NW NW Sec. 29-5-3 ..... Drlg. 4,330 ft.

MUSKOGEE COUNTY

Elk Drilling Co.'s No. 1 Jones, SW cor. SW Sec. 34-13-17 ..... Shut down 400 ft.
L. T. Haney's No. 1 Mitchell, SE cor. NW SE Sec. 33-13-18 ..... Drlg. 2,307 ft.
J. L. Slusher's No. 1 Nave, NE cor. SW NW Sec. 20-15-20 ..... Shut down 775 ft.

HUGHES COUNTY

Bauer and others' No. 1 Penn, NW cor. SW NE Sec. 1-8-10 ..... Dry and abandoned 4,255 ft.
E. W. Whitney and others' No. 1 Moore, SE cor. SW Sec. 17-5-9 ..... Underreaming 3,345 ft.
Pure Oil Co.'s No. 1 Fixico, NE cor. SW Sec. 18-8-9..... Dry and abandoned 4,500 ft.
Howard Petroleum Co.'s No. 1 Gilbert, NW cor. SE Sec. 25-8-10 ..... Drlg. 4,428 ft.
Gypsy Oil Co.'s No. 1 McGirt, NE cor. NW SW Sec. 21-6-8 ..... Sand 3,310-30 ft.; corrected, hole full water.
T. B. Slick, Inc.'s No. 1 Epperly, NW cor. NE NW Sec. 12-6-8 ..... Dry in Wilcox, 4,655 ft., plugging back.

CANADIAN COUNTY

Wirt Franklin Pet. Co.'s No. 1 North, NW cor. NW Sec. 18-13-10w ..... Drilling 2,180 ft.

OKLAHOMA COUNTY

Slick & Bailey's No. 1 Koester, C SE NE Sec. 18-13-3w.. Drlg. 4,770 ft.
Cromwell & Franklin's No. 1 Thompson, SW cor. NE NE Sec. 15-12-3w ..... Drlg. core head 7,124 ft.
Indian Terr. Ill. Oil Co.'s No. 1 fee, C SE SE Sec. 24-11-3w ..... Flowing 5,697 bbls. daily from 6,498 ft.

OKFUSKEE COUNTY

Moose & Daniels' No. 1 Stidham, SW cor. NW Sec. 4-11-10 ..... Shut down 622 ft.
T. B. Slick Inc.'s No. 1 Wolf, SE cor. NE SE Sec. 21-11-7.. Standardizing 3,900 ft.
Dixie Oil Co.'s No. 1 Drew, NE cor. SW Sec. 8-13-10..... Dry and abandoned 3,437 ft.
Erwin and others' No. 1 Patterson, NW cor. SE. Sec. 15-13-9 ..... Location.

SEQUOYAH COUNTY

Cooper & Badger's No. 1 Young, NW cor. NE NE Sec. 7-12-20 ..... Shut down.
Hunt and others' No. 1 Unknown, SE cor. NW SW Sec. 12-12-23 ..... Drlg. 900 ft.
Buffington et al's No. 1 Melcher, C SW NW Sec. 31-12-24 ..... Casing 2,215 ft.

PAWNEE COUNTY

Washoma Oil Co. and others' No. 1 Buffalo, SE cor. NE Sec. 33-22-6 ..... Shut down 3,813 ft.

POTTAWATOMIE COUNTY

Phillips-Atlantic's No. 1 Winrow, SW cor. NE NE Sec. 11-9-4 ..... Dry and abandoned 4,672 ft.
Shell Pet. Corp.'s No. 1 Livingston, SW cor. SE Sec. 33-7-5 ..... Standardizing 4,328 ft.
Superior Oil Co.'s No. 1 Herminghausen, SW cor. NW NE Sec. 24-8-2 ..... Standardizing 4,926 ft.
Shell Pet. Corp.'s No. 1 Lowe, SW cor. NW NE Sec. 17-6-5 ..... Cleaning out 4,920 ft.
Pure Oil Co.'s No. 1 Lindley, SE cor. SW SE Sec. 18-8-5.. Hunton 4,124-40 ft., flowing 1,600 bbls.
T. B. Slick's No. 1 Sailor, SE cor. NW NW Sec. 12-8-3.... Drlg. 3,665 ft.
T. B. Slick and Shell Pet. Corp.'s No. 1 Hurst, SE cor. NW NW Sec. 17-7-2 ..... Fishing 6,098 ft.
Tomlinson et al's No. 1 Wisenhurst, NW cor. NE SE Sec. 35-7-5 ..... Wilcox sand 4,582-94 ft.; hole full water; dry and abandoned.
Phillips Petroleum Co.'s No. 1 Parman, SE cor. SW Sec. 15-8-4 ..... Wilcox sand 4,644-73; 3,000 ft. of water; dry and abandoned.
Champlin Refining Co.'s No. 1 Foster, SW cor. NE SW Sec. 14-7-5 ..... Dry and abandoned 4,424 ft.
Shell Pet. Corp.'s No. 1 Wyatt, SW cor. NW NE Sec. 17-6-5 ..... Dry and abandoned 4,414 ft.
Mid-Continent Petroleum Corp.'s No. 1 James, SE cor. SE Sec. 22-5-3 ..... Location

CADDO COUNTY

Magnolia Petroleum Co.'s No. 1 Shelby, SW cor. SW Sec. 28-10-12w ..... Dry and abandoned 4,472 ft.
J. B. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w.... Shut down 150 ft.
Wirt Franklin's No. 1 North, NW cor. NW Sec. 18-10-13w. Drlg. 1,775 ft.
W. J. Hartley's No. 1 Galbreath, SE cor. NW SE Sec. 29-5-12w ..... Shut down 3,394 ft.
English Drilling Co.'s No. 2 Pruitt, CNL NW SE Sec. 22-6-10w ..... Rigged up and shut down.
Red Bank Oil Co.'s No. 1 Shanklin, C NW Sec. 15-12-11w. Dry and abandoned 4,603 ft.

OSAGE COUNTY

White Eagle Oil & Ref. Co.'s No. 1, SE cor. NE Sec. 25-26-6 ..... Dry and abandoned 2,802 ft.

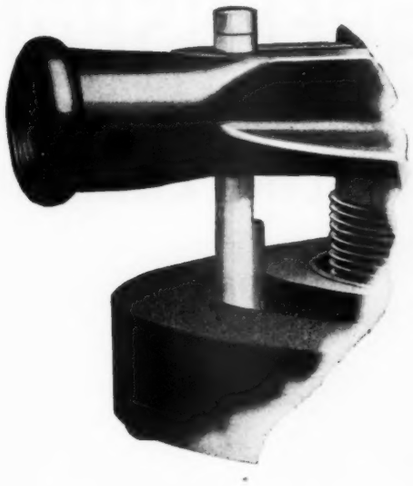
STEPHENS COUNTY

Wade-Martin & Smythe's No. 1 Vestal, NE cor. SE Sec. 20-2-5w ..... Dry and abandoned 2,510 ft.
Stahl & Burris' No. 1 Jefferson, SE cor. NE NW Sec. 3-1-7w ..... Shut down 2,624 ft.

SEMINOLE COUNTY

Prairie Oil & Gas Co.'s No. 1 Davis, NE SE Sec. 21-10-7.. Drlg. 3,737 ft.
Superior and Fuhrman's No. 1 Fay, NW cor. SE SW Sec. 27-11-6 ..... Drlg. 4,755 ft.
Magnolia Pet. Co.'s No. 1 Germany, SE cor. NW Sec. 30-9-5 ..... Underreaming 4,405 ft.; 1 bailer water per hour from Simpson.
Phillips Pet. Co.'s No. 1 Miller, NW cor. SW Sec. 34-11-7 ..... Drlg. 3,230 ft.
Burke-Greis Oil Co.'s No. 1 Cyrus, SE cor. NE NW Sec. 13-9-7 ..... Fishing 3,420 ft.
Harris and others' No. 1 Stidham, SE cor. NW Sec. 10-9-8 ..... Dry and abandoned 4,582 ft.
C. B. Shaffer's No. 1 Carolina, SE cor. SW NE Sec. 4-6-7. Drlg. 4,725 ft.
E. W. Whitney's No. 1 Harjo, NE cor. NW NE Sec. 25-7-6 ..... Plugged back 4,325 ft., and shut down.
Gypsy Oil Co.'s No. 1 Andrews, NE SE NW Sec. 27-10-7 ..... Shut down 3,730 ft.
Shaffer Oil & Ref. Co.'s No. 1 Catchoches, SW cor. SW NE Sec. 18-10-7 ..... Dry and abandoned 3,782 ft.
Prairie Oil & Gas Co.'s No. 1 Rogers, SE cor. NE SE Sec. 14-10-6 ..... Dry and abandoned 4,729 ft.
T. W. Adkins' No. 1 Reed, NE cor. NW Sec. 2-8-8..... Drlg. 4,185 ft.
T. B. Slick, Inc.'s No. 1 Tiger, NW cor. SW SE Sec. 13-8-5 ..... Dry and abandoned.
Magnolia Petroleum Co.'s No. 1 Sissy, NW cor. NE Sec. 33-8-7 ..... Wilcox 4,332-42 ft.; hole full of water; dry and abandoned.

(Continued on Page 114)



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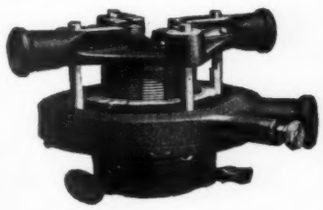

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PIPE FOR ALL PURPOSES

KENTUCKY-TENNESSEE

(Continued from Page 59)

with an initial production the first 24 hours of 90 bbls. The company got a surprise when it drilled in No. 10 on the "Dutch" Tompkins lease in the Red Hill district and discovered it was a dry hole. This has been a most remarkable producing piece of land.

In the Burton Pool, the Pops Development Co.'s second test on the Marion Taylor farm is reported at 35 bbls. initially. No. 3 same farm, is also said to be good for 35 bbls.

Evans and Garrison's No. 3 on the H. B. Trodgen farm, in the Red Hill Field, is estimated at 25 bbls.

Huff and Calderwood are drilling No. 3 on the Mrs. Bell Salmon farm, east of the Burton Pool. L. C. Young and others are drilling a test on the W. O. Ridgeway farm in the Red Hill Pool. Smith, Randolph and others are starting No. 8 on the Oscar Wells farm, in the Utica Field, and nearing sands with Nos. 6 and 7 same farm. Botts, Swarthout and others are drilling No. 2 on the Rhodes farm, about 2 miles southeast of Whitesville. Robbins and Stimson are working at No. 3 on the Doctor Fireline farm, in the southeastern part of the county. McMahan & Combs are drilling No. 3 on the Fuqua 50 acres, near the Jones Pool. Bert Thompson is drilling on the J. A. Coomes 30 acres, near the Roby Pool. The Ohio Oil Co. is drilling No. 1 on the Frank Higdon farm, same area. Evans & Garrison are drilling No. 4 on the H. B. Trodgen, in the Red Hill Pool.

Ohio County Wells

The best completion reported from the Ohio County fields was Dr. F. M. Sirman's No. 7 on the Nancy Farmers, about 3 miles north of Fordsville, estimated at 50 bbls. initial production.

The Creek Drilling Co.'s No. 4 on the C. D. Westerfield farm, in the King Pool, north of the Ambrose Pool, produced an initial of 30 bbls. from a total depth of 625 feet. A string of 601 feet of casing was set, and sand found from 609 to 624 feet.

D. T. Bolling set a string of 580 feet of casing in his No. 2 on the O. Westerfield farm, in the Whittaker Pool, got the sand at from 585 to 600 feet and shot with 60 quarts, getting a 15-bbl. pumper.

James C. Ellis struck a duster at No. 3 on the Ira Moseley farm, near Taffy.

Sidney Petroleum Co. got a nice flow of gas in the Jones sand on the Wilbur Carden farm, 4 miles southeast of Whitesville, and is going down to the Barlow sand in hopes of striking an oil producer.

T. L. Ogle, Lewis and others are near the sand on the Jim Kellem farm, near the hamlet of Herbert.

Maple, Lyle and others are in the top of the sand on the Tom Howard farm, in the Bells Run area, northwest of the Ambrose Pool.

In the Gainesville area of the Scottsville Field of Allen County, George L. Porter found a dry hole on the W. I. Nitcher farm, at 401 feet.

EASTERN FIELDS

(Continued from Page 59)

don sand. In the same district, the Cameron Heat & Light Co. completed a Gordon sand gasser on the Hannah Strickland farm.

Marion County

In Mannington district, Marion County, the Carnegie Natural Gas Co.'s second test on the W. R. Grubb farm is a gasser in the Fourth sand. In Clay district, the Philadelphia Gas Co. has a gasser in the Bayard sand on the Isaac Phillips farm.

West Virginia Tests

On Hartley Run, Ravenwood district, Jackson County, the Heck Oil Co. has the rig completed for a test on the C. D. Warren 97 acres. On Fishing Creek, Liberty district, Marshall County, the Manufacturers Light & Heat Co. has the rig completed on the E. and M. J. Allman farm. On Sandy Creek, Ravenwood district, Jackson County, the Heck Oil Co. has the rig completed for a second test on the A. J. Brown farm.

On Holts Run, DeKalb district, Gilmer County, the Hope Construction & Refining Co. has a rig up on the Frank Wilson farm. The same company has the rig completed for a second test on the V. M. Nicholson farm. In Geary district, Roane County, the South Penn Oil Co. has the rig completed for No. 80 on the O. D. Stockly farm. On Birch Branch of Elk River, Big Sandy district, Kanawha County, has the rig completed for another test on the King Land Co.'s property. On Georges Branch of McElroy Creek, McElroy district, Tyler County, the Hope Natural Gas Co. has a rig up on the M. V. George farm.

In Grant district, Ritchie County, the Carnegie Natural Gas Co. has started to drill on the Margaret Starkey farm. In the same district, H. N. Rinehart has started to drill another test on his own farm. In Union district, the Imperial Oil Co. has started to drill on the T. A. Baker farm. In Walker district, Wood County, John Leeton & Co. have a rig up on the D. M. Copeline farm. In Mannington district, Marion County, J. J. Allen is making a road to a location on the O. C. Thorn farm.

Roane County

In Geary district, Roane County, the United Carbon Co. has started to drill on the Caroline Harold farm. In the same district, the United Fuel Gas Co. is rigging up on the C. R. Stump farm. The same company has part of the rig material at a location on the W. W. Ogden farm. In Smithfield district, the same company is building a rig on the William Shaffer & Co. farm. In Ripley Township, Jackson County, the H. F. Parsons Oil & Gas Co. has part of the rig material at a location on the George W. Coats farm. In Hackers Creek district, Lewis County, the McCall Drilling Co. is down 2,950 feet on the I. M. Bergeroff farm.

On Robinson Run, McClellan district, Godfrey L. Cabot has started to drill on the Lee Taylor farm. In the same district, Rand & Moses have rig material at a location on the A. F. Lyons farm. In Meade district, Tyler County, the Ohio Oil Co. has shut down on the Guilford Dudley heirs' farm. In Union district, the Brook Oil Co. has shut down on the Edward Brooks farm. In Sand Hill district, Marshall County, the Myers Oil & Gas Co. is rigging up on the C. M. Strickland farm. The same company is building a rig on the George M. Myers farm. In Liberty district, the Carnegie Natural Gas Co. has started to drill on the T. D. Conaway farm.

In Ravenwood district, Jackson County, the Heck Oil Co. is rigging up on the C. D. Warren farm. In Washington district, Calhoun County, the Hope Natural Gas Co. has rig material at a location on the William Lamb farm. In Sheridan district, W. S. Dailey & Co. are rigging up on the Robert E. Maze farm. In Lee district, F. F. McIntosh is building a rig on the John Morgan heirs' farm.

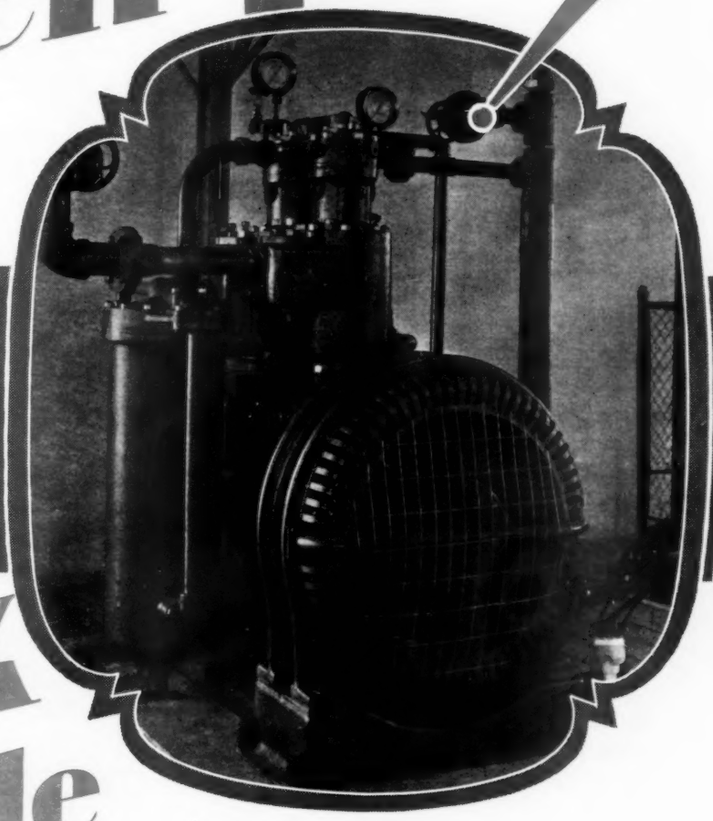
Southwest Pennsylvania

In Springhill Township, Greene County, the Renner Oil & Gas Trust Co. drilled deeper a test on the Emanuel Renner farm. It is a duster in the Fifth sand. In Morris Township, the Carnegie Natural Gas Co.'s No. 6 on the James R. Rutan farm is swabbing 15 bbls. a day.

In Buffalo Township, Butler County, J. F. Trees agitated his second test on his own farm and increased its production to 100 bbls. an hour. It only lasted for a few hours and then declined to 20 bbls. an hour. Owing to the nature of the oil, having a large amount of paraffin, the pipe line company is having a great deal of trouble in keeping its lines open for running the oil.

The oil excitement in Buffalo Township has been heightened with the bringing in of a well reported to be doing 20 bbls. an hour. It was drilled by the Bream Oil Co.

Have You Seen This



COMPRESSOR—Two or four vertical cylinders, two-stage or single-stage; 11″ stroke.

MOTOR—90 H.P., 400 R.P.M. Floor space, 76″x53″, height 85″. Weight, 11,000 pounds.

CLARK Portable Motor-Driven Compressor

With this machine, efficient compressor service is quickly available at low cost for installation and operation. Complete enclosure of working parts, automatic lubrication and perfect balance, insure durability.

Ask for complete details on the CLARK Vertical Motor Driven Compressor—and the CLARK Vertical Gas Engine direct connected to Generator.

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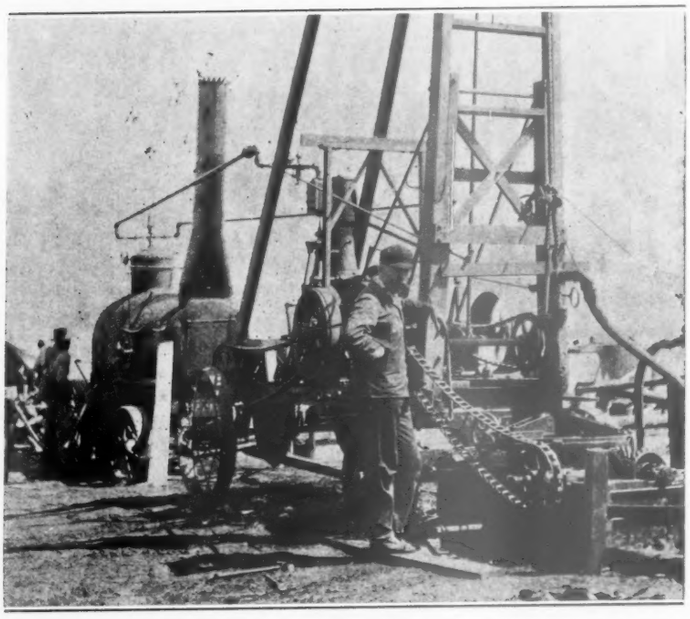

- - - back in 1900

THE first portable rotary used in Texas was employed in drilling 10" rice irrigation wells during the early rice boom in East Texas in 1900. This outfit, shown herewith, was designed and built by W. R. "Frosty" Martin, the wise-looking roughneck in the foreground.

Since 1900, many changes have been made in portable rotaries and new drilling problems have developed. To answer a distinct need in modern rotary drilling, W. R. Martin developed the

Martin-Loomis
Automatic Recording
Weight Indicator

The increased drilling efficiency and minimized hazards resulting from the use of the Martin-Loomis Weight Indicator has won for it a place on the rigs of progressive operators all over the world. This time, money and equipment conserving device pays for itself in a very short time—an investment that will pay dividends for many years.

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Mid-Continent Distributors
Reed Roller Bit Company
Houston, Texas

Foreign Distributors
Oil Well Supply Company
Pittsburgh, Pa.

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 111)

McCulloch Oil Co.'s No. 1 McGilbray, SW cor. SW NE Sec. 4-8-8 ..... Hole full of water 1,940 ft.
Empire Gas & Fuel Co.'s No. 1 Harjo, SW cor. NW SE Sec. 17-7-6 ..... Hole full water, Wilcox 4,593-4,6[illegible] ft.
Marland Oil Co.'s No. 1 Strothers, NW cor. SE NE Sec. 5-10-7 ..... Fishing 3,550 ft.
Magnolia Pet. Co.'s No. 1 Carroll, SW cor. NW SE Sec. 1-7-5 ..... Drlg. 4,310 ft.
T. B. Slick, and others' No. 1 Davis, NE cor. NE Sec. 26-6-6 ..... Shut down 1,085 ft.

TILLMAN COUNTY

Allen & Treadwell's No. 1 Howell, NW cor. SE Sec. 13-1-17w ..... Shut down 538 ft.

MAJOR COUNTY

Randau & Mooney's No. 1 Parker, SE cor. NE NW Sec. 4-22-16w ..... Show of oil 1,235 ft.; shut down
Earl and others' No. 1 Turner, C NE NE Sec. 23-20-14w.. Rig.
Wilson et al's No. 1 Unknown, NE cor. NE Sec. 4-23-16w. Cellar.

WOODS COUNTY

E. K. Miller's No. 1 Copenhavers, NW cor. NW Sec. 18-24-13w ..... Rig.
Gypsy-Prairie and others' No. 1 Thompson, SE cor. SW Sec. 10-25-15w ..... Casing 1,346 ft.
Sinclair Oil & Gas Co.'s No. 1 Thompson, C SW SW Sec. 33-27-16w ..... Moving in tools.

MURRAY COUNTY

Bison Oil Co.'s No. 1 Labor, NW cor. NW Sec. 17-1-2.... Shut down for casing 1,900 ft.

DEWEY COUNTY

Huckaby & McCoy's No. 1 Perfect, NE cor. NE Sec. 9-18-15w ..... Shut down 4,355 ft.
Don Sifers' No. 1 Jordan, SW cor. NW Sec. 16-18-17w.... Spudded and shut down.

BECKHAM COUNTY

C. & H. Petroleum Co.'s No. 1 Barnes, SW cor. NW NE Sec. 32-9-22w ..... Shut down 3,460 ft.
Martin and others' No. 1 Chuck, NW cor. SE Sec. 1-8-25w. Casing 2,547 ft.
L. C. Hivicks' No. 1 Davis, C NW NE Sec. 4-11-26w.... Shut down 725 ft.
Producers Exploration Co.'s No. 1 Seidell, SE cor. SW SW Sec. 17-9-22w ..... Shut down 2,402 ft.
Carson and others' No. 1 Danby, SW cor. SE NE Sec. 20-8-22w ..... Drlg. 790 ft.
Pfeiffel and others' No. 1-A Carter, NE cor. NE Sec. 35-9-22w ..... Shut down 1,500 ft.
Day Oil Co.'s No. 1 Ault, NW cor. NW Sec. 33-8-21w.... Drlg. 1,473 ft.

GRADY COUNTY

Remington and others' No. 1 Fryrear, SW SW NE Sec. 13-9-5w ..... Shut down 720 ft.
J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w.... Spudded and shut down.
J. M. Henry and others' No. 1 Abraham, SE cor. NW Sec. 4-5-8w ..... Rig.
Commerce Development Co.'s No. 1 Taylor, C NE NW Sec. 4-3-7w ..... Testing sand 2,410-21 ft.
J. B. Nichols' No. 1 Brake, SE cor. NE SE Sec. 7-5-7w... Shut down 2,307 ft.

McINTOSH COUNTY

Marione and others' No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Shut down 2,387 ft.; corrected.
Patterson and others' No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Shut down 5,451 ft.
Wolfe and others' No. 1 Unknown, NW cor. SE Sec. 15-12-18 ..... Rig on ground.

CLEVELAND COUNTY

Daniels & LeWright's No. 1 Vandever, C SW Sec. 15-7-1w ..... Shut down 3,130 ft.
Phillips Pet. and T. B. Slick's No. 1 Hentleman, NE cor. NE Sec. 8-10-2w ..... Drlg. 2,780 ft.

KIOWA COUNTY

Blue Mountain Oil Co.'s No. 1 Jones, SE cor. NW NW Sec. 17-5-14w ..... Shut down 530 ft.
J. M. Burke's No. 1 Fox, SW cor. NW Sec. 4-6-16w..... Abandoned 937 ft.
Johnson & McDowell's No. 1 Thompson, SW cor. NE Sec. 6-6-15w ..... Drlg. 2,370 ft.
Adams et al's No. 1 Fanning, NW cor. SW Sec. 2-6-17w.. Machine.
Dave Malernee's No. 1 Van Kirk, NW cor. NW Sec. 28-7-15w ..... Shut down 858 ft. in granite.
A. C. Varner and others' No. 1 Bonham, CSL NW NW Sec. 5-6-13w ..... Shut down 1,127 ft.

CUSTER COUNTY

W. E. Witt's No. 1 Wellman, C SE Sec. 1-14-14w..... Rig and tools.

PONTOTOC COUNTY

Moore & Curran's No. 1 Allen, SE cor. SW SW Sec. 22-5-5 ..... Shut down 1,460 ft.
American Oil Refining Co.'s No. 1 Jones, NE cor. NE Sec. 18-5-5 ..... Sand 2,500-40 ft., swab 40 bbls

GARVIN COUNTY

R. F. Garland's No. 1 Strickland, SW NW SW Sec. 10-4-3 ..... Dry and abandoned 3,493 ft.

COMANCHE COUNTY

Green and others' No. 1 Wilson, C NE SW Sec. 14-1-12w.. Shut down 4,055 ft.
Wirt Franklin Pet. Co.'s No. 2 Holler, NW cor. NW Sec. 2-4-11w .. .. Drlg. 3,023 ft.

COAL COUNTY

Indian Territory Illuminating Oil Co.'s No. 1 Cook, SW cor. NW Sec. 10-1-11. ..... Drlg. 5,735 ft.
Robert Galbreath and others' No. 1 Jones, SW cor. SE Sec. 24-1-9 ..... Shut down 3,270 ft.

PITTSBURG COUNTY

Kerr & Koy's No. 1 Hall, C NW NW Sec. 32-4-12..... Spudded.

JACKSON COUNTY

Altus Oil Co.'s No. 1 Northington, NE cor. NE Sec. 4-1-20w ..... Shut down 2,020 ft.

SOUTHERN OKLAHOMA

BRYAN COUNTY

Alexander & Oppenheimer's No. 1 Hampton, SE cor. NE Sec. 26-7s-11 ..... Shut down 1,425 ft.
McNull & Gross' No. 1 Smith, CEL SE NW NE Sec. 11-6s-9e ..... Shut down 375 ft.

MURRAY COUNTY

Alter and others' No. 1 Johnson, SW cor. NW Sec. 14-4-7. Spudded and shut down.

COTTON COUNTY

Cuyler & Pyson's No. 1 Thomas, SE cor. SE SW Sec. 16-4-12w ..... Shut down 2,127 ft.

JEFFERSON COUNTY

Sec. 25-6s-6w ..... Dry and abandoned 2,172 ft.
Bridwell et al's No. 1 Trout, CEL NE Sec. 33-5s-6w..... Drlg. 1,528 ft.
Amerada Pet. Corp.'s No. 1 Emerson, NW cor. SE SW, Section 28-5s-8w ..... Shut down 4,516 ft.

CHOCTAW COUNTY

Choctaw Petroleum Co.'s No. 1 Wilson, SW cor. SW Sec. 15-6-19 ..... Shut down 1,346 ft.

TILMAN COUNTY

Bray and others' No. 1 Barker, NE cor. SW NW Sec. 9-1-15w ..... Shut down 805 ft.
Dixie Oil Co.'s No. 1 McKinney, NE cor. NE Sec. 29-3s-18w ..... Drlg. 1,761 ft.
Stanley & McGregor's No. 1 Mock, NW cor. NW SW Sec. 33-1-20w ..... Dry and abandoned 2,445 ft.
Landfair and others' No. 1 Smith, SE SW SE Sec. 6-2s-15w ..... Shut down 2,535 ft.

JOHNSTON COUNTY

Wapanucka Oil Co.'s No. 1 Banks, Sec. 28-2s-9 ..... Shut down 1,530 ft.
Bush Creek Oil Co.'s No. 1 Kirby, SE cor. NE NW Sec. 9-4-7 ..... Shut down for casing 405 ft.
Smith & Kinsley's No. 1 Lane, SE cor. NW Sec. 29-1-7... Shut down 1,306 ft.
Yale Oil Syndicate's No. 1 Craige, C NW NE Sec. 36-2s-9 ..... Fishing 830 ft.
Sullivan and others' No. 1 Wines, NW NE NW Sec. 11-7s-5e ..... Shut down 475 ft.
E. J. Stump and others' No. 1 McGinnis, SW Sec. 26-3s-8w ..... Rig.
McCrow and others' No. 1 Trust, SW Sec. 12-1s-8e..... Drlg. 1,525 ft.

CARTER COUNTY

Devonian Oil Co.'s No. 1 Myer, NW cor. SE Sec. 19-5s-3w. Drlg. 1,675 ft.
Avon-Dickey's No. 1 Anderson, NE cor. SE NE SE Sec. 32-4s-2 ..... Spudded.
Schermerhorn Oil Co.'s No. 2 Joliff, NE NW Sec. 24-5s-1e ..... Spudded.
Humble Oil & Ref. Co.'s No. 1 Hitchcock, SE NE Sec. 12-4s-3e ..... Drlg. 810 ft.

CENTRAL WEST

(Continued from Page 62)

rent farm reported completed last month.

Pike County—No. 9 being drilled on the Amon W. Atkinson farm, Section 23, Logan Township, by Perry C. Andrews, is 1,350 feet deep and down for orders. The Fannie Fowler well, Section 26, same township, being drilled by H. C. Darby and others, has not been completed. The August Yeager No. 6 being drilled by the Gem Oil Corp., and reported last month as a big gas well, is making 2,500 feet a day.

Posey County—As a result of the drilling of two wells in the northeastern part of the county, it is reported additional leases are being taken between Wendel & Parker.

Spencer County—Wiser Oil Co. ran into water at 1,447 feet in a test well on the Cord Dooley farm, Section 5, Luce Township, near Hatfield. It is reported there was a good showing of oil at 1,000 feet. The Packard Oil Co. has started a well on the A. C. Grass farm, west of Troy and near its recently completed gas well on the Arthur Ray farm. Not far from this well Ben Robinson and others are drilling on the A. C. Huff farm. In the western part of the county on the John C. Kinney heirs farm, Section 16, Grass Township, C. W. Randall and others got a dry hole at 1,259 feet.

Steuben County—Production of the well reported completed last month on the Peter Snowberger farm, Steuben Township, is 5 bbls.

Sullivan County—J. F. Bolinger and others drilled to 2,360 feet in their well on the J. Harris farm, Section 2, Turman Township, and encountered water. An effort was made to get rid of the water, but the well has been plugged back to 2,334 feet, where a test for gas will be made. The Dome Gas Co. is drilling for gas on the A. Cushman farm, Section 7, same township. In the southwestern part of the county south of New Lebanon in Gill Township, Fred F. Bays has started a deep test on the Morris Unger farm. In Fairbanks Township, Wyman & Brown brought in a 40-bbl. well at 2,274 feet in No. 2 on the Tutt Mayfield farm, Section 5. Charles Scott and others' No. 2 on the Scott farm, Section 6, Fairbanks Township, pumped 15 bbls. at a depth of 2,176 feet.

Vanderburg County—The Morrison Oil Co. got a dry hole at 2,163 feet on the George Kraft farm, Section 3, Armstrong Township, L. A. Martin Co. have shut down their well on the John Wills farm, Section 32, same township, at 1,585 feet.

Vigo County—No. 18 on the William Riggs farm, Prairie Creek Township, drilled by the Siosi Oil Corp. was reported good for 30 bbls. at 2,233 feet. This company also got a 30-bbl. well on the Joe Thomas farm, Section 32, same township. No report has been received from the F. L. Shattuck No. 3.

Warrick County—A well has been started southeast of Boonville and is down 400 feet but no detailed report has been received.

Illinois

Illinois made a better showing in completed work than for some time so far as numbers are concerned. A wildcat drilled by Snavely, Holmes and others, 400 feet from the south and west lines of the S. C. Prevo farm, in the SW of Section 29, York Township, Clark County, and far removed from production came in a dry hole. This is a very interesting test, owing to the depth the hole was drilled, for an area that has developed most of its oil in the Casey shallow sand. The test went to a total depth of 2,375 feet.

In Crawford County, Southwest Township, the Dark Bend Oil Co.'s No. 3 well, 250 feet from the south line and 1,275 feet from the east line of the J. D. and F. L. Price farm, in the NE of Section 24, pumped an initial of 5 bbls. from the Kirkwood sand at 1,542 feet, after given a 40-quart shot. The Big Four Oil & Gas Co. is drilling a second test on the John D. Waggoner farm, same section. Dinsmoor Oil Co. is drilling No. 6 M. E. Thomas farm, Section 34, Martin Township. In Honey Creek Township, same county, R. W. Moore and others' test in the southwest corner of the R. Brownfield farm, in the SW of Section 18, was a dry hole at 1,530 feet. Edward Kerlin's test, 600 feet from the south line and 220 from the west line of the Lafe Godd farm, in the NE of Section 17, found no oil but struck a fair gas well at a depth of 970 feet and will use the gas for further drilling in the vicinity.

In Petty Township, Lawrence County, the Ohio Oil Co.'s No. 8 well, 660 feet from the north and west lines of the L. B. Nuttall farm, in the SW of Section 25, produced 15 bbls. initial under pump from the Tracy sand at 1,660 feet and shot with 40 quarts. Same company is drilling No. 3 on the Dora A. Hipshire No. 3 farm, same section.

In the Allendale Field of Wabash Township, Wabash County, Mayhugh and others' No. 15 in the SE cor. of the Kogan heirs lease, in the SE of Section 2, pumped 15 bbls. initial from the Cisil sand at from 1,560-70 feet, or 10 feet in the sand. The Adams Corner Oil Co. is starting a test on the L. G. Stillwell farm, Section 12, and Joe S. Young, Jr., and others are starting a second test on another of the L. G. Stillwell farms, same section.

CANADIAN FIELDS

(Continued from Page 53)

rods. The well is bailing around 35 bbls. of light crude per day, but this apparently filters from the Home and Dalhousie sands between the 6-inch and 8-inch casing. Home's No. 4, LSD 14, same section, is at 404 feet and running 20-inch casing. Home's No. 3, same LSD, is in the top of the Home sands at 4,429 feet, underreaming and lowering casing; some traces of oil have been met already in this sand.

Royalite Oil Co.'s No. 12, LSD 3, Section 13-20-3w5, is drilling and underreaming at 3,075 feet. Royalite's No. 13, LSD 6, Section 13-20-3w5, is drilling at 4,856 feet. Royalite's No. 15, LSD 1, Section 12-20-3w5, is standing cemented at 2,902 feet. Royalite's No. 16, LSD 2, Section 12-20-3w5, is drilling at 4,508 feet. Royalite's No. 17, LSD 2, Section 6-20-2w5, is drilling at 3,930 feet. Royalite's No. 18, LSD 15, Section 12-20-3w5, is standing cemented at 3,812 feet. Royalite's No. 19, LSD 5, Section 6-20-2w5, is at 3,445 feet and drilling and underreaming. Royalite's No. 20, LSD 7, Section 12-20-3w5, is drilling at 2,945 feet and carrying down 10-inch casing. Royalite's No. 21 is drilling at 611 feet. Royalite's No. 22, gas storage well, Section 13-20-3w5, is still standing at 2,250 feet. Royalite's No. 23 has made a location in NW, Section 31-19-2w5. North West Associated's No. 1, LSD 6, Section 20-19-2w5, is drilling at 3,149 feet.

Okalta Oil's No. 2, LSD 8, Section 1-20-3w5, in light crude production at 3,170 feet, has been put on the pump and is reported to average around 150 bbls. a day. Production will probably be taken from this horizon for some time before continuing the test to the deep lime. Okalta's No. 3, LSD 9, same section, is reported drilling around 2,400 feet.

Okalta's No. 1 gusher, LSD 1, Section 1-20-3w5, which encountered a record wet gas production in the deep lime at 5,040 feet, is running with two new separators attached, but definite results have not yet been determined. The well had been reported making between 500 and 600 bbls. a day, and the new separators are expected to increase the crude oil recovery. Some freezing has been noted, but so far the production has never been entirely cut off.

To Resume Drilling

Calmont Oils' No. 1, LSD 2, Section 1-20-3w5, has installed a control head and also a separator to handle anticipated wet gas production, and will resume drilling in the deep lime at 5,650 feet, after cleaning out the bridge formed by three shots. Back pressure applied in an effort to clear out the debris resulted in considerable spurts of wet gas and amber-colored oil. A production test may be made as soon as the bridge is cleared out.

Regent Oil Co.'s No. 1, LSD 16, Section 1-20-3w5, looks like a fair producing well in the deep lime. Drilling halted at 3,845 feet and a 10-day production test is being made; the wet gas flow is around 7,000,000 feet a day, with a crude naphtha recovery around 50 bbls.

McLeod Oil Co.'s No. 3, LSD 16, Section 1-20-3w5, is at 4,862 feet and after a final unsuccessful attempt to recover the lost drill rods is trying to drill past them. McLeod's No. 4, same LSD, is drilling below 4,100 feet. This test is more than 300 feet in the deep lime. In the upper part of the lime what looked like a big wet gas production estimated as high as 30,000,000 feet, was encountered, and a record well was expected that would surpass Royalite's No. 4 gusher. McLeod's No. 4, however, failed to hold up, and will now be carried deeper for a thorough test of the lime. The well is in good shape for deeper drilling, and McLeod Oil Co. officials state it will be carried 1,000 feet into the lime if necessary. Even were this done, its actual drilling depth would be considerably less than that attained by a number of Turner Valley wells which have barely reached the producing horizon in the upper lime.

Spooner Oils' No. 2, Section 24-20-3w5, has finished installing a diamond drill outfit and started drilling into the lime at 5,080 feet. A separator has been installed.

Illinois-Alberta Oils' No. 2, LSD 14, Section 12-20-3w5, at 3,550 feet is definitely in the deep lime. Casing is being run and will be cemented in the top of the lime before drilling into production. New McDougall-Segur Oil Co.'s No. 2, same LSD, which after reaching 4,510 feet was cemented back to 4,200 feet on account of caving, is drilling through the cement at around 4,300 feet.

United Oils' No. 2, LSD 2, Section 24-20-3w5, is drilling in a very hard formation at 5,105 feet. Advance Oil Co.'s No. 5, LSD 16, Section 19-19-2w5, has resumed drilling around 2,800 feet, after several weeks' shutdown owing to water shortage. Arrangements have been made to secure water from the Imperial Oil, Ltd.'s system. Mayland Oil Co.'s No. 1, LSD 10, Section 17-19-2w5, is drilling in the Home sands at 4,800 feet, with about 2,000 feet of light crude in the hole. The boilers have been moved back.

Freeman-Lundy Syndicate, LSD 10, Section 1-20-3w5, has resumed drilling after setting casing at 100 feet. This test is on a 20-acre lease north of Okalta Oils' and close to the southern boundary of the McLeod Oil Co. leases.

British Dominion Oil Development Corp.'s No. 2, LSD 6, Section 12-20-3w5, is in the first McDougall-Segur sand at 3,450 feet and running casing. A fair show of light crude was met and commercial production is looked for in the lower sand, around 3,500 feet.

Freehold Oil Co.'s No. 1, SW, Section 3-21-3w5, is rigging up for a third start at 2,450 feet after having two derricks burned in as many weeks.

New Development

A group of Ontario capitalists headed by Louis Blake Duff of Welland, president of East Crest Oil Co., recently visited the Turner Valley Field where, it is understood, they are planning additional development work on recently acquired acreage. The party included Frank J. Bearss, Gordon Austin, S. H. Moore, G. C. Price and Leslie West of Toronto; Frank H. Leslie, J. W. Butters and Newton Wiley of Niagara Falls, and Roy Kelday of Hamilton. A tentative location was made for East Crest's No. 2 well, and a further drilling program was discussed in the course of the visit.

Considerable leasing is reported in the Taber district, southern Alberta, where a number of the early homesteads carry oil and gas rights. Two Calgary operators are reported to have secured some acreage, and a number of Taber business men have also been active.

In the Wainwright Field, east central Alberta, Wainwell Oils' No. 1, LSD 9, Section 36-44-7w4, is on the pump and making between 350 and 500 bbls. a day, with some water. Wainwell's No. 3, LSD 9, Section 36-33-7w3, is in production and waiting for pumping outfit. Wainwell's No. 2, LSD 15, Section 36-44-7w4, has changed to rotary and has set and cemented casing at 680 feet for the first water suhtoff. Production is expected at 2,165 feet. It is reported that the rotary outfit will be used for two independent tests before starting Wainwell's No. 4. Sasko-Wainwright Oil & Gas Co.'s No. 1, LSD 1, Section 19-45-6w4, has started to drill through the cement at 2,242 feet into production. Cores previously indicated a good saturation. Wainwell Refineries, Ltd., is reported taking production from the field and has started shipment of its output.

Ontario Fields

In the Ontario fields, Devonian Oil & Minerals, Ltd., has been incorporated with $1,000,000 capitalization and office at Toronto to develop oil and mineral lands in that portion of northern Ontario south of James Bay. A drilling outfit will be sent north this spring. The territory is entirely untested, though structural conditions and outcrops indicate good prospects of production. The region is a palaeozoic area, with indications pointing to possibilities of shallow production similar to that found in the early oil fields of southwestern Ontario. Officers of the company include: President and managing director, R. P. Hall, Toronto; first vice president, G. F. Gregory, Petrolia; second vice president, H. C. Hall, Toronto; secretary-treasurer, E. G. Farrow, Toronto; directors, J. Linden, R. Murdoch, Toronto.

In Dawn Township, Lambton County, Union Natural Gas Co.'s No. 29, Lot 25, Concession 6, has finished a dry hole. Union's No. 28, Lot 24, Concession 13, Dawn Township, in the east send, finished a small gasser in the Dawn sand, good for slightly more than 100,000 feet a day. Union's No. 25, Lot 19, Concession 1 Dawn, in the west end, was drilled through the Trenton limestone to the granite for a thorough test of the deep formations. No production was encountered except a small flow of gas, less than 100,000 feet a day, in the Dawn sand (Salina formation.) Further drilling will be undertaken by the Union company in 1929. In Tilbury East Township, Kent County, no new drilling has been started yet. The Southern Ontario Gas Co. some time ago finished a dry hole near Coatsworth, in Romney Township.

SOUTHWEST WILDCATS

(Continued from Page 46)

in it but there has been very little wildcat drilling in the county thus far.

Carolina-Texas

In the Carolina-Texas district in Webb County both W. R. Shankle's No. 1 Webster and Foster-Barnsley's No. 1 Webster, which last week had showings, failed to develop anything of importance. Shankle got 40 joints of salt water at 2,015-28 feet and is now down at 2,300 feet and Foster-Barnsley with a showing last week at 2,200 feet is now down 2,450 feet. It is 2,600 feet where they expect to get pay in the sand that is producing in the Carson well and they should reach it in another week and the result will go far toward telling whether it will be a pool or a pimple.

Cosner-Danmier's No. 1 Benavides in Block 6, Survey 11, in Zapata County, a little northwest of the old Mirando Valley Pool, has set 6⅝-inch casing at 1,520 feet and had sand down to 1,530 feet. Gleason got a gas well making some oil in that survey some months ago. The Cosner-Danmier well is looked upon as of great importance to that area and will decide much as to whether or not it will be a pool. A great deal is expected of it.

Duval County

National Oil Co.'s No. 2 Ball, 300 feet to north and west lines of Block 5 of subdivision of Ball ranch, is using magnetometer to check location. Magnolia Petroleum Co.'s No. 2-A Hahl, Survey 51, located 150 feet to south and east lines, is drilling at 4,563 feet. O. Henry Oil Co.'s No. 1 Henry, Block 1,879 of Snodgrass subdivision of east corner of Mesquite grant, 450 feet to southeast lines

550 Miles of Transmission Lines of the Southern California Gas Co. protected by McEVERLAST

One of the West's great public utility companies—serving millions—now using McEverlast protection almost exclusively. No guesswork here! Pipe protection is a matter of many thousands of dollars! Every product the company adopts has to run the gauntlet of biting tests—in the field and laboratory. McEverlast Protective Coatings came through with flying colors! "Tests show remarkable results," was the report. Since then McEverlast Protection has been applied to 550 miles of transmission lines, varying in size from 8 inches to 16 inches.

Other Big Users

This big gas company is but one of a rapidly growing list of giant corporations now using McEverlast Protective Coatings. Among the present users, some of whom have standardized on McEverlast are:

Southern California Gas Company, Los Angeles Gas and Electric Company, Shell Company of California, Pan-American Petroleum Company, Sun Oil Company, Simms Oil Company, California Petroleum Company, General Petroleum Company, California Eastern Oil Co., Western Oil and Refining Company, Richfield Oil Co., Industrial Fuel & Supply Co., Chanslor-Canfield Midway Company, Union Pacific Railway, Hercules Gasoline Company, City of Los Angeles and twenty-nine other cities in the Southwest.

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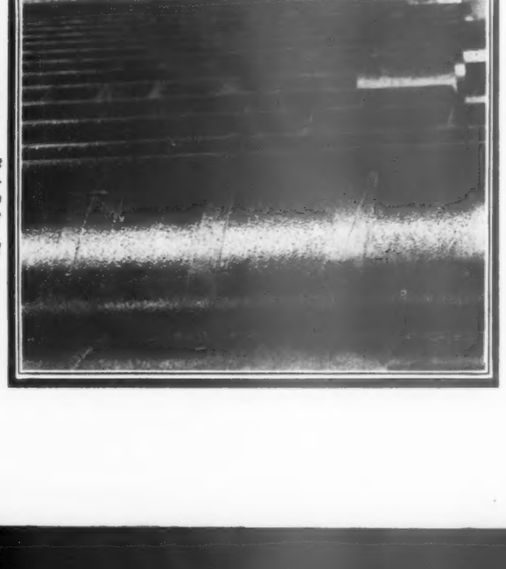

Closeup of pipe just after receiving McEverlast protection in the shops of the Crane Co., Los Angeles. Note the smooth, hard surface.

and 220 feet to northeast lines, is drilling at 660 feet.

Starr County

The Texas Company's No. 1 Ofelia Resendez, Porcion 69, Block 174, located 150 feet to south and east lines, is drilling at 3,250 feet. Crays & McCardle's No. 1 Hicks & Hicks, Perdernal grant, 150 feet to northeast lines and 200 feet to southeast lines, is moving on.

Webb County

Edouard Raymond's No. 1 Schmellzer, Share 2, J. Galan grant, Brewster pasture, is moving on. G. S. Lumpkin's No. 1 H. Yeager, Porcion 33-34-35, Block 17, is location 1,170 feet to east line and 150 feet to south line. L. W. Nelson's No. 1 Moglia, Survey 672, is location 150 feet to east line and 2,584 feet to south line.

Zapata County

National Oil Co.'s No. 1 Don B. Adams, center of north half of Section 11, Block 4, of subdivision of Don B. Adams tract, is moving in rig. John Pappas' No. 1 Cuellar, Porcion 33-34, Block 5, is moving on.

Bastrop County

Gypsy Producing Co.'s No. 1 Lottman estate has resumed drilling at 2,146 feet and is down 2,320 feet. Billy Mayfiled's (Krebs & Leach) No. 2 McColl, Stephen F. Austin Survey, 50 yards west of No. 1, is shut down at 1,010 feet.

Bexar County

Amelia Balgart, Cortari Survey No. 5, is location in the northwest corner. Allen Burnam's No. 1 Ward, A. A. Gardiner Survey, is shut down at 1,600 feet. Dixie Oil Co.'s No. 1 Medina Irrigation Co., William Miller Survey No. 180, located 1,666 feet to north line and 470 feet to west line, spudded in and shut down. George F. Hinton is making location 2 miles south of Gas Ridge. Humble Oil & Refining Co.'s No. 2 Oppenheimer, J. M. Urriegas Survey, is location 300 feet north of No. 1. Indian Creek Oil & Gas Co.'s No. 1 W. Wolfsohl, J. A. Navarro Survey No. 5, is location 180 feet to CEL.

William M. Morgan's No. 1 E. S. Bridge, about 400 feet southeast of juncture of Hildebrandt and Gardner roads, is moving in rig. Moore & Jauer's No. 1 Holly R. Ellison, T. York Survey, 2,916 feet to east line and 1,500 feet to south line, has set casing at 300 feet in top of the Georgetown. B. L. Raborn's No. 1 Engelmann, John James Survey No. 73, located 300 feet to south line and 600 feet to east line, has recently resumed drilling at 1,715 feet after being shut down for over a year.

Blanco County

Robert A. Rodson's No. 1 Glasscock, Survey 50, located 150 feet to CEL, is standing at 962 feet with oil in the hole.

Caldwell County

Fred Adams' No. 1 Burney, Gideon Pace Survey, is shut down at 2,802 feet in Edwards, with sulphur water. John V. Edwards' No. 1 W. C. Caldwell, Cornelius Crenshaw Survey, 600 feet to south line and 300 feet to east line, is fishing at 1,700 feet. Rogers & Heap's No. 1 F. W. Forrester, Thomas J. Halton Survey, 450 feet to west line and 750 feet to south line, topped Edwards at 1,608 feet. George B. Walker and others' (S. M. Oil Co.) No. 1 L. H. Linch, Dorothy Benton Survey, 300 feet to south and west lines, has set casing at 1,832 feet to test oil showing in chalk.

Calhoun County

B. F. Thompson's No. 1 H. S. and F. C. Thomas, John P. Tully Survey, 910 varas north of north corner of John C. Post Survey, is drilling at 2,390 feet.

Colorado County

National Oil Co.'s No. 1 H. T. Brandt, Freeman Pettus League, is location 150 feet to south line and 1,000 feet west of the highway.

Edwards County

McMan Oil & Gas Co.'s No. 1-B Walter Schreiner, H.E.&W.T. Railway Survey, Section 50, Block F, 330 feet to south and east lines, is fishing at 3,995 feet.

Fayette County

Marshall & Moore's No. 1 John A. Kerr, M. Muldoon League No. 5, about 250 varas to north line and little west of center, is shut down at 2,078 feet. National Oil Co.'s No. 1 J. C. Melcher, S. M. Williams League No. 1, located 300 feet to north and east lines, is drilling at 250 feet. R. E. Phalon's No. 1 Cervenka, Fayette County school lands, is drilling at 2,782 feet.

Frio County

Austin Johnson and others' No. 1 Eschenburg, E. Gallagher Survey No. 788, is location 1,250 feet to east line and 1,625 feet to south line. Pilgrim Oil Co.'s No. 2 Blackaller, James Gouley Survey, is standing at 3,218 feet waiting on rock bit.

Goliad County

J. E. Alexander's No. 1 Bergman, Goliad Survey, Block 30, located 250 feet to west line and 950 feet to south line, is shut down at 600 feet. Booth McCarson's No. 1 H. L. Murray, Golind Survey, 200 feet to west line and 150 feet to south line, is location; No. 1 Flake is drilling. Southern Crude Oil Purchasing Co.'s No. 1 J. E. Pettus, near Cabeza Creek, is drilling at 3,595 feet.

Gonzales County

Joe Bruner's No. 1 Miller, Richard Keath Survey, 3,040 feet to north line and 200 feet to east line, is shut down for repairs on rig. W. D. Flynn's No. 1 Wilhausen, S. Bateman Survey, east central part, is at 4,800 feet, moving on heavier rig to go 6,000 feet. L. P. Unkel's No. 1 Lumm & Bouldin, R. Ward Survey, Block 10, located 570 feet to CSL, at 380 feet, is moving heavier rig on to deepen.

Guadalupe County

Pat Armstrong's No. 1 Halm, Wakefield Survey, has derrick up. G. A. Greene's No. 1 B. B. Dix, Ira Nash Survey, 610 feet north of road and 320 feet to east line, is drilling at 565 feet. J. J. Christie's No. 1 Taylor Thomas, Gustavus Chotwell Survey, 1,100 feet to southwest lines and 1,130 feet to southeast lines, at 1,053 feet, total depth, has set casing at 970 feet. Miller Brothers' No. 1 Gip Springs, E. Cortari Survey, 450 feet to west line and 775 feet to south line, is in chalk at 1,901 feet and showing oil.

Hays County

Estess-Moore & King's No. 1 C. N. Sledge, Hunton & Jones Survey, 285 feet to northwest lines, is standing at 804 feet.

Jackson County

J. B. Douglas' No. 1 C. O. Lowrance, John McHenry Survey, 720 varas to northwest lines and 3,700 varas to southwest lines, is shut down at 3,020 feet. The Texas Company's No. 1 W. C. Moore, I.&G.N. Survey No. 208, located 5,108 feet to south line and 150 feet to west line, is drilling at 2,925 feet. Wright Brothers' No. 2 Classen is down 3,300 feet; No. 6 Drushell is deepening.

Karnes County

W. E. Hewitt's No. 1 W. E. Porter, 6 miles south of Runge, has spudded in.

Kinney County

Mardon Oil Co.'s No. 1 Jim Clamp, Survey 346, Section 1,492, is drilling at 2,508 feet in upper part of the Edwards.

Lavaca County

The Texas Company's No. 1 Russek, H. Martin Survey, 150 feet to south and west lines, is drilling at 60 feet.

Live Oak County

Houston Oil Co.'s No. 1-A Brown Land & Cattle Co., M. B. Kivlin grant, is location. J. K. Rowan's No. 1 Lyne, Survey 171, is location in south central part. W. J. Walton's No. 3 C. H. Wedding, 300 feet west of No. 2, expects to deepen.

Maverick County

Ryan Consolidated Petroleum Co.'s No. 2 Indio ranch, Survey 7, A. Rivas, northeast corner, is at 1,320 feet. Rycade Oil Co.'s No. 3 Chittim, Section 116, Block 7, located 10 feet to west line and 225 feet to south line, is drilling at 210 feet; No. 3 Sullivan, Section 71, Block 7, located 520 feet to west line and 2,137 feet to south line, is at 5,125 feet showing 2,000,000 feet of gas saturated with oil.

Medina County

California-Medina's No. 1 Rothe, Survey 1,012, at 3,278 feet is pulling casing to deepen. Carl G. Cromwell's No. 1 Taylor, Section 135, Block 28, located 210 feet to north line and 155 feet to east line, is shut down at 350 feet. Donaldson Oil Development Co.'s No. 1 Adams, Joseph Hillemeyer Survey No. 25, located 160 feet to east line and 1,227 feet to south line, is drilling at 1,900 feet. Ferguson and others' No. 2 Odom.

H. Castro Survey, is drilling at 200 feet. North and South Development Co.'s No. 1 Charles Nehr, Survey 441, located 150 feet to south line and 7,479 feet to east line, is drilling at 3,212 feet.

Nueces County

Nueces River Basin Development Co.'s No. 1 F. C. Allen, G. Farrier Survey, 1,596 feet to south line and 474 feet to west line, is shut down at 2,908 feet.

Refugio County

Blanco Creek Oil Co.'s No. 1 St. John, J. Scott Survey, 708 feet to northwest lines and 3,074 feet to northeast lines, is drilling at 1,800 feet. Dunlap & Wilkinson's No. 1 Rooke, 10 miles south of the gas field, is standing at 2,750 feet. J. M. Davis and Tom Horn's No. 1 Howard, Section 8, located 600 feet to north line and 2,640 feet to east line, is at 1,957 feet waiting for drill stem. Magnolia Petroleum Co.'s No. 1 Glenewinkle, J. Scott Survey, 330 feet to south and east lines, is drilling at 200 feet.

San Patricio County

C. I. Albertson's No. 1 Boscamp, W. R. Hazen Survey, Block 10, located 200 feet to CNL, is shut down at 1,420 feet. George B. Pickett's No. 1 Whitworth, NW NW Section 60, is shut down at 3,250 feet.

Travis County

Flynn Brothers' No. 1 St. Edwards University, has spudded in and is drilling with spudding machine.

Uvalde County

Pure Oil Co.'s No. 2 J. D. Smythe, G.C.&S.F. Railway Survey No. 687, located 1,920 feet south and 265 feet east of No. 1, has been spudded in.

Victoria County

Houston Oil Co.'s No. 3 McFaddin is location for a deep test; No. 2 Dr. Allen Kyle is drilling at 860 feet. Humble Oil & Refining Co.'s No. 1 Kohutek is location near Nursery.

GULF COAST FIELDS

(Continued from Page 48)

drilling sticky shale at 3,390 feet. Gulf Production Co. has a rig up for No. 51 Davis, a new test, and one up to deepen its No. 36 Davis, a former producer.

Hardin County Domes

At Batson, Ada Belle Oil Co.'s No. 125 McGoldrick, a shallow test, is drilling at 363 feet. East Batson Oil Co. also started a shallow test at Batson, its No. 17 Stateland, and B. O. Poole is rigged up for No. 1 Paraffine. Rio Bravo Oil Co.'s No. 135 B.B.B.&C., Saratoga, is being rigged up to pump, it having 150 feet of oil standing in the hole at a total depth of 1,126 feet.

Pierce Junction—Harris County

Abercrombie & Harrison's No. 3 Ritter, deep extension test on the north flank, is coring shale at 4,530 feet. Rio Bravo Oil Co.'s No. 6-A Settegast, west flank, an old well deepening, is in sticky shale at 4,385 feet, at which depth it tried to blow out. No. 9-A Settegast, formerly completed as a 2,000-bbl. well at 4,428 feet last October, is being rigged up to deepen. No. 13-A Settegast, a wildcat on the extreme southern edge of the lease, is rigged up. T. G. Shaw and Texas Exploration Co.'s No. 2-D Fitzsimmons, northeast side of the dome, is in a sandy shale showing oil at 4,194 feet. No. 3-E Fitzsimmons is in an oil showing sand topped at 4,376 feet and is coring ahead at 4,392 feet.

Navarro Oil Co.'s No. 3-A Cain, east side of the dome, is drilling sticky shale at 5,525 feet. Navarro Oil Co. and Humble Oil & Refining Co.'s No. 1 Dooley, an old well deepened, went into heavy shale to 4,527 feet and now is to be plugged back to a sand higher up.

Goose Creek—Harris County

Humble Oil & Refining Co.'s No. 74 Simms-Smith, a wildcat northeast of the field, is drilling sticky shale at 6,592 feet. Gulf Production Co.'s No. 13 Paddoc-Smith is drilling below 3,326 feet. Atlantic Oil Producing Co. is rigging up to deepen No. 20 Gaillard (21-acre tract).

Spindletop—Jefferson County

Gulf Production Co.'s No. 17 Marrs McLean is standing around 5,305 feet. Yount Lee Oil Co.'s No. 50 McFaddin is fishing. This well tested salt water at 3,625 feet. No. 53 McFaddin is milling at 4,550 feet. No. 89 McFaddin tested salt water at 3,825 feet and will be deepened. No. 90 McFaddin is drilling rock at 2,590 feet. No. 91 McFaddin is drilling rock at 2,975 feet. No. 92 McFaddin is spudding in and No. 93 McFaddin is rigging. No. 2 fee is standing at 3,875 feet and No. 1 Davis is drilling shale and lime at 6,400 feet.

On its Gladys City tracts, Yount Lee Oil Co.'s No. 21 is preparing to drill deeper after testing salt water at 4,100 feet. No. 73 is sidetracking at 3,056 feet and No. 74 is in sand at 2,900 feet. Nos. 75, 76 and 77 are rigging up.

Hull—Liberty County

Empire Gas & Fuel Co.'s No. 17 Barngrover had set screen as the week closed and was preparing to test sand at a total depth of 3,774 feet. Gulf Production Co.'s No. 68 Phoenix is drilling below 3,654 feet, its No. 92 Phoenix below 3,056 feet and its No. 25 Morris-Phillips is spudding. Mecom Oil Co.'s No. 10 Taylor is standing rigged up. Republic Production Co.'s No. 25 Dolbear is drilling below 3,943 feet and its No. 53 Dolbear at 1,500 feet.

Orange—Orange County

Sun Oil Co.'s No. 6 Brown has drilled to 6,100 feet in heaving shale and is standing. Continental Oil Co. is rigging up to deepen its No. 14 Chesson and Brownie-Babbett Oil Co.'s No. 5 McLean, another former well to be deepened, is sidetracking at 2,495 feet.

Raccoon Bend—Austin County

Humble Oil & Refining Co.-Valley Oil Corp.'s No. 1-C Grawunder is drilling sandy shale at 2,560 feet. Their No. 2 Hardy is drilling shale and lime at 1,925 feet, and their No. 2 E. B. Wilson is drilling shale at 889 feet. These operators' No. 1 J. W. Wilson, No. 2 E. Kearns, No. 1 E. Ueckert have been rigged up and are ready to start drilling. No. 3 Roy Thompson and No. 1 Dietrichs are standing as derricks and No. 1 Sherrill a location.

DeWalt—Fort Bend County

Humble Oil & Refining Co.'s No. 2 Deatherage is drilling gumbo at 2,076 feet. No. 1 Nelson is drilling sandy shale at 3,305 feet. No. 2 Camp is standing rigged. A derrick has been erected for No. 3 Brazos Farms, and Nos. 2 and 4 Brazos Farms and No. 5 Sugarland are locations. The latter, made the past week, is in the southwest corner of the Sugarland tract, southwest of the discovery well.

SOUTH LOUISIANA

Jennings—Acadia Parish

E. F. Simms' No. 1 Grace Vonschuler, west flank deep sand test, is drilling hard sand at 4,785 feet. This operator also is getting ready to start immediate drilling on No. 2 Ernest Cockrell, which has been standing as a location since late August. This is 100 feet west of No. 1, which discovered the first deep oil on the west flank. Gulf Refining Co.'s No. 36 Jennings-Clemont, a former well being deepened, is drilling at 3,193 feet. Jennings Petroleum Co.'s No. 2 Eunice Crowley is fishing drill stem stuck at 2,500 feet, total depth of the hole being at 3,690 feet. F. J. Getty's No. 1 Clemont is being rigged up to pump from a sand at 1,920 feet. On the east side of the dome, The Texas Company's No. 107 Latrielle has started drilling and is drilling below 1,000 feet. Yount Lee Oil Co.'s No. 6 Housierre-Latrielle is drilling sand at 5,126 feet.

Lockport—Calcasieu Parish

Of particular interest at Lockport is the purchase by the Shell Petroleum Corp. of a tract of the Miller estate north of the holding of the Vacuum Oil Co. and the Gulf Refining Co. and the building of a derrick for No. 1 Miller. All operations at Lockport in the past have been jointly by the Vacuum and Gulf.

The latter operators' No. 22 Miller has drilled into an oil sand to a total depth of 4,336 feet and is setting casing to test. No. 13 Miller, a former well at 4,405 feet, is being rigged up to deepen. No. 20 Miller, another old well, is drilling deeper in sticky shale at 3,431 feet. No. 23 Miller blew out while drilling in sticky shale at 3,114 feet, blowing the drill stem out of the hole. The blowout lasted only a short time and drilling will be resumed.

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No. 1 Henshaw-LeMoin is drilling hard sand rock at 5,492 feet.

Vinton—Calcasieu Parish

Gulf Refining Co.'s No. 47 Star-Vincent is drilling below 3,374 feet. Marrs McLean's No. 12 Gray is drilling at 646 feet; Vinton Petroleum Co.'s No. 1 Matilda Gray at 2,147 feet and its No. 10 Vincent at 2,306 feet. Salt Dome Oil Co.'s No. 1 Shaw has oil standing in the hole from a sand at a total depth of 2,938 feet and is being rigged to pump.

Edgerly—Calcasieu Parish

Rex Petroleum Co.'s No. 9 Hunter is drilling gumbo at 3,322 feet. Drysdale & Savoy's No. 3 Hill has set strainer to test an oil-showing sand at approximately 3,147 feet.

Hackberry—Cameron Parish

Cameron Oil Co.'s No. 1 Vincent on the south side of the old Hackberry Dome where first commercial production recently was opened, was coring sand at 2,940 feet at latest report. Cherokee Oil Co.'s No. 1 Duhon is rigged up. Noble Oil & Gas Co.'s No. 3 Ellender has spudded in. Sutton, Seiss & Green's No. 1 Sonnier is drilling gumbo at 1,345 feet. Yount Lee Oil Co.'s No. 1 Perkins is drilling gumbo and boulders at 2,658 feet and its No. 1 Vincent is rigged up.

Rycade Oil Corp.'s No. 1 Gulf Land on the north side of this dome was bailing Saturday to test a sandy shale showing oil at a total depth of 4,319 feet. Yount Lee Oil Co. has abandoned its No. 8 School Land in salt below 4,325 feet.

With the completion the past week of Calcasieu Oil Co.'s No. 12 Watkins, there is nothing drilling temporarily at East Hackberry but The Texas Company has a location for No. 4-B Calcasieu Lake. The latter being in deep water of the lake, some time will be required to build a derrick and rig up.

Miscellaneous Fields

At Orchard, Gulf Production Co.'s No. 18 Moore is drilling sand and lime at 625 feet. Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 4 Hudson, Markham, is drilling gummy shale at 1,692 feet. Sinclair Oil & Gas Co.'s No. 5 Norton, Damon Mound, is drilling lime rock at 3,803 feet. The same company's No. 20 Jackson is in shale at 3,796 feet.

A. G. Broussard's No. 1 Bergeron, Anse La Butte, St. Martin Parish, Louisiana, formerly abandoned at 1,368 feet, is being rigged up to deepen. Pure Oil Co.'s No. 7 Yount Lee Oil Co., Sweet Lake, is drilling sand and shale showing some gas at 4,555 feet. No. 8 Yount Lee Oil Co. is drilling water sand at 3,653 feet.

MISCELLANEOUS WILDCATS

Texas

Brazoria County—At Allen Dome, Shell Petroleum Corp.'s No. 1 Random, was being bailed Saturday to test a hard sand, shale and lime formation at 5,035 feet. This company's No. 3 Reece is drilling hard, sandy lime at 2,754 feet, and its No. 5 Allen is drilling brittle sandy shale at 4,360 feet. Empire Gas & Fuel Co.'s No. 2 Brock, Stratton Ridge, is in gumbo at 248 feet, where 10-inch surface casing is being set. O. A. Meyers' No. 1 Davidson, Clemens Dome, was deepened to 1,070 feet where it has been abandoned as a junked hole.

Chambers County—Pure Oil Co. has started drilling in its fourth test on the Lost Lake Dome of northern Chambers County. This is the No. 1 Mays, which Saturday was in surface clay at 41 feet. This company's No. 2 Lost Lake is drilling gumbo at 2,520 feet. Gulf Production Co.'s No. 1 Wilborn, Hankamer Dome prospect, is drilling at 3,442 feet.

Fort Bend County—Gulf Production Co.'s No. 10 Trone, Long Point Dome, is drilling lime rock at 787 feet. South Texas Petroleum Co.'s No. 1 Hartfield, Needville Dome prospect, is in an oil showing sand at a total depth of 4,985 feet and is setting 6⅝-inch casing to test.

Hardin County—Gaddy Oil Co.'s No. 1 Sternberg, near Kountz, has started to drill deeper after testing fresh water at 1,077 feet.

Harris County—Baldwin and associates have resumed drilling on their No. 1 Kitzman, north of Cypress, and are in shale at 3,086 feet. Humble Oil & Refining Co.'s No. 1 Minnetex, Mykawa, is drilling sandy shale at 5,171 feet. This company's No. 5 Warren, Hockley, is waiting the rebuilding of derrick and rig. It is in sand and lime at 1,060 feet.

Jackson County—The Texas Company's No. 1 Moore, Jackson County, north of Edna, is drilling limey shale at 3,000 feet.

Jefferson County—The Texas Company's No. 1 Pipkin, Big Hill, is drilling sand and lime at 3,310 feet. Bleakie Oil Co.'s No. 1 Tolliver, north of Westbury, is drilling surface formation at 184 feet. Westbury Syndicate's No. 1 West, northeast of Westbury, is drilling at 2,672 feet.

Liberty County—Humble Oil & Refining Co.'s No. 3 Sterling, Moss Bluff Dome, is at a total depth of 2,965 feet in anhydrite, and is reaming. Union Exploration Co. has a rig up for No. 2 Esperson, 3,100 feet north of No. 1 which was abandoned two weeks ago at 5,798 feet.

Matagorda County—Crossland and associates' No. 1 Hawkins, Shepherd's Mott, has set 9⅝-inch casing to test a gas showing reported at a total depth of 2,630 feet.

Orange County—The Texas Company is rigging up for No. 1 Kuhn, the first test to be drilled on the new dome prospect discovered across the river from Port Neches.

Wharton County—Hearte and associates' No. 1 Brown, south of El Campo, is drilling sand and shale at 1,508 feet.

South Louisiana

Cameron Parish — Shell Petroleum Corp.'s No. 6 Watkins, Black Bayou, is drilling sandy shale at 2,606 feet. No. 7 Watkins is being rigged up. The Texas Company's location for No. 3-A Calcasieu Lake, Calcasieu Lake Dome, is standing.

Iberia Parish—Gulf Refining Co.'s No. 8-Z State, Loreauville, is drilling sand at 712 feet. This company's No. 3 Kling, same dome, is in sand at 2,379 feet. No. 1 Moresi is standing as a derrick. At Jefferson Island, Jefferson Lake Oil Co.'s No. 1 Lake Peigneur is drilling at 700 feet in gumbo. The Texas Company's No. 3-A Vermillion Bay is drilling sand at 3,823 feet. The latter was taken over from the Louisiana Land & Exploration Co. the past week.

Iberville Parish — Shell Petroleum Corp.'s No. 3 Wilbert, White Castle Dome, is drilling sticky shale just below 1,480 feet where 14-inch plug was drilled out.

Miscellaneous Parishes—Gulf Refining Co.'s No. 8 Stark, Thibodaux, LaFourche Parish, is in cap rock at 1,252-54 feet and is temporarily abandoned, and No. 9 Stark is being rigged up. The Texas Company's No. 1 Botney Bay, Port Barre, St. Landry Parish, is drilling gumbo at 2,810 feet. Ohio Oil Co.'s No. 3 Martin, Hager Dome, St. Martin Parish, still is fishing. Total depth of the hole is 4,022 feet but fishing is in sidetracked hole at 2,108 feet. Joan Development Co.'s No. 1 Lake Superior, Tangiphoa Parish, is building derrick. The Texas Company's No. 1-A Timbalier Bay, No. 1-B Lake Pelto and No. 1 Lake Barre, all Terrebonne Parish, and on domes recently acquired for development from the Louisiana Land & Exploration Co., are still locations, and being in waterways it probably will be several weeks before derricks can be got up on any of them. Evangeline Oil Co.'s No. 1 Crowell-Spencer, Pine Prairie, Evangeline Parish, is drilling sandy shale at 4,506 feet. All other wildcats in southern Louisiana are standing at previously reported depths.

LOUISIANA-ARKANSAS

(Continued from Page 51)

derrick up in Section 11-9-1e, for No. 7 Zenoraia Lumber Co.

Monroe District

Morehouse Parish—Amalgamated Co. set 12-inch at 194 feet on No. 3 Fairly, Section 53-20-4, and is drilling at 240 feet. Natural Gas Producing Co. is drilling No. 22 Crossett, Section 35-21-4, at 1,600 feet. Southern Carbon Co. set 180 feet of 12-inch surface pipe on No. 51 fee, Section 15-20-4, second hole; No. 8 Tensas, Section 2-20-4, cemented 8-inch at 874 feet and is drilling at 910 feet.

Ouachita Parish—Hatcher & Evans' No. 8 Hatcher, Section 21-19-4, is drilling at 350 feet. G. E. Jordan is arranging to retest No. 1 Wall, Section 12-18-3, at 2,300 feet, total depth 3,347 feet. Magnolia Petroleum Co.'s No. 2 Morrison, Section 2-19-4, set 15-inch casing at 200 feet and at the same depth on No. 1 United States, Section 18-19-5. Ouachita Natural Gas Co.'s No. 5 Lieber, Section 4-19-4, is in gumbo at 1,100 feet. Palmer Corp.'s No. 5 fee, Section 24-19-4, cemented 12-inch at 244 feet and 8-inch at 847 feet. Pipes & Mack are rigging up on No. 2 McGee, 4,176 feet east and 660 feet south NW cor. Section 10-18-4. United Carbon Co.'s No. 3 fee, Section 6-19-5, is drilling at 1,725 feet.

Union Parish—United Carbon Co.'s No. 1 Nichols, Section 6-20-3, set 178 feet of 12-inch casing.

Richland Parish

Community Oil & Gas Co.'s No. 1 Buie, Section 33-16-6, is shut down at 1,800 feet. Magnolia Petroleum Co.'s No. 2 Sartor, Section 16-16-6, is dry at 2,450 feet; was dry again at 2,495 feet and is arranging to run core barrel. Ouachita Natural Gas Co. set 12-inch at 194 feet and 8-inch at 866 feet on No. 5 Pardue, Section 5-15-6.

Webster Parish

Cotton Valley—Cotton Valley Syndicate cemented 6⅝-inch at 4,228 feet on No. 19 Hope, Section 24-21-10. Magnolia Petroleum Co. is drilling lime and sand at 3,347 feet on No. 4 Ira Cox, Section 23-21-10; No. 6 Marshall is a location in the C SW SE, Section 21-21-10.

Sarepta-Shongaloo — Magnolia Petroleum Co. has rig up to drill No. 3 H. M. Branton in Section 6-22-9; No. 1 B. M. Cook is a location 330 feet north and west SE cor. NE NE Section 2-22-11, and No. 1 Sally Coyle is a location 330 feet south and west NE cor. SE NE, Section 2-22-11; No. 1 Denman, Section 1-22-11, is drilling at 1,260 feet. Northwest Louisiana Gas Co.'s No. 9 Pine Woods, Section 34-23-11, is drilling at 3,040 feet.

ARKANSAS

Johnson County

Arkansas Natural Gas Corp. is drilling sand at 1,245 feet on No. 1 McPherson, Section 10-10-24; No. 2 Bynum, Section 12-10-24, is drilling sand at 160 feet.

Nevada County

Humble Oil & Refining Co. has derrick up for No. 5-B Groves, 990 feet east and 330 feet north SW cor. Section 1-14-21; No. 2 Haynie, Section 6-14-20, cemented 6⅝-inch at 1,146 feet, total depth 1,148 feet; No. 2 Hain, Section 1-14-21, is drilling red and gray sand at 2,286 feet.

Ouachita County

Smackover—Gulf Refining Co. is rigging up to deepen No. 9-A Goodwin, Section 5-16-15, completed August 8, 1925, pumping 250 bbls. from 2,379 feet. Phillips Petroleum Co. is coring No. 30 Joyce, Section 33-15-15, at 2,708 feet; Simms Oil Co. cemented the bottom on No. 11 Hildebrandt, Section 33-15-15, total depth 2,746 feet, and is arranging to drop whipstock at 2,430 feet.

Union County

Champagnolle—O. W. Estes tested 40,000,000 feet of gas with a spray of oil at 2,842-52 feet on No. 1 Alice Gregory, Section 15-17-14, and is arranging to cement 6⅝-inch at 2,852 feet. J. W. Hooser's No. 4 Slade, Section 3-17-14, bailed dry at 3,239 feet and tested hole full of salt water, total depth 3,254 feet. H. L. Hunt's No. 4 Gregory, 255 feet east and 210 feet north SW cor. SW SE, Section 10-17-14, set 136 feet of 10-inch and is drilling at 1,480 feet; E. C. Johnson (Arkansas Drilling Co.'s) No. 3 Gregory, Section 10-17-14, cemented 6⅝-inch at 2,769 feet to test 8 feet of sand, total depth 2,783 feet. Lion Oil Refining Corp's No. 5 Union Sawmill, Section 7-17-13, is coring at 3,755 feet. Magnolia Petroleum Co. set 211 feet of 15½-inch and is drilling at 740 feet on No. 3 Alice Gregory, Section 15-17-14. Marine Oil Co.'s No. 2 Sample, Section 7-17-13, is bailing to test 6 feet of sand, total depth 3,044 feet.

Ohio Oil Co.'s No. 3 Carroll, Section 6-17-13, set 6⅝-inch at 2,991 feet to test 3 feet of sand, total depth 2,995 feet; No. 2 Frazier, Section 6-17-13, is rigged up ready to drill; No. 1 Nash, Account 2, Section 6-17-13, cemented 188 feet of 10-inch and is drilling at 1,577 feet on second hole; Oilwell Corp.'s No. 2-A Kelly, Section 9-17-14, was dry at 3,305 feet, tested salt water and cemented bottom at 3,394 feet; Olson Brothers cemented 6⅝-inch at 2,794 feet on No. 1 Kelly, Section 9-17-14, total depth 2,806 feet. Pure Oil Co. tested salt water at 3,226-35 feet on No. 6 Gregory, Section 15-17-14, and shut down for orders. Rusing and others' No. 7 Gregory, Section 11-17-14, is waiting on standard rig to pump with 600 feet of fluid, 60 per cent water, in the hole from 16 feet of sand, total depth 3,214 feet. Skelly Oil Co. is perforating 6⅝-inch at 2,605-10 feet and No. 1 Gregory, Section 15-17-14, total depth 3,295 feet.

El Dorado—Gulf Refining Co. set 297 feet of 12½-inch on No. 2 Gaddy, Section 30-17-14; No. 1 Woodley, Section 6-18-14, tested salt water at 3,143 feet and cored red shale at 3,188 feet. Louisiana Iron & Supply Co. is setting liner on No. 10 Fitzgerald, Section 8-18-15, with 158 feet of fluid in the hole from 58 feet of broken sand, total depth 2,190 feet.

East Texas

Harrison County

C. H. Lyons and others are rigging up to deepen No. 2-A Bryson in the E. Pollock Survey and are drilling No. 3 Furth, second hole, in the J. Short Survey at 2,000 feet.

Panola County

S. E. Davidson and others' No. 1 Johns in the W. H. Wooley Survey is coring at 2,650 feet. Eureka Natural Gas Co. is drilling No. 1 Becknell, Elijah Williams Survey, at 2,619 feet; No. 2 Gully in the J. Matthews Survey, tested 2,000,000 feet of gas in chalk rock at 1,503 feet and set 4½-inch at 1,500 feet. Magnolia Petroleum Co. is rigging up on No. 2 T. C. Adams in the E. Jones Survey and has location in the B. C. Jordan Survey for No. 2 Lula Fletcher; No. 13 Steele, B. C. Jordan Survey, was dry at 2,637 feet and cored red shale at 2,652 feet. Natural Gas Producing Co. set 100 feet of 12½-inch and is drilling at 275 feet on No. 8 Roquemore in the B. C. Jordan Survey. Nemours Corp.'s No. 1 Lawless in the L. Chisholm Survey is drilling at 820 feet.

LA.-ARK. WILDCATS

(Continued from Page 51)

their pre-holiday shutdown, are back on the active list with J. G. Marcum and others washing to bottom on No. 1 De-Yampert, Section 5-19-4, total depth 2,672 feet, and The Texas Company's No. 1 Keifer, Section 11-18-4, drilling at around 300 feet. C. E. Harris' No. 1 Holmes, Section 9-16-7, has been abandoned, total depth 310 feet, where 12-inch surface string was set last July.

Joe Hurley and others are arranging to drill 6⅝-inch plug at 2,125 feet on No. 1 Arkansas Timber Co., Section 29-16-12, Calhoun County, to test 10 feet of Nacatoch, total depth 2,314 feet. Leo Yount has assembled block of 10,000 acres centering in Section 10-17-18, and has derrick up for a 3,500-foot test in that section provided he can sell off checkerboarded spreads and get some dry hole money.

Charles McDonald has derrick up for No. 1 Wilson in the SE cor. SW NW, Section 25-15-18, Ouachita County, a half mile northwest of McDonald Brothers' No. 1 Wilson, which is fishing for testing tools, total depth 2,808 feet, 13 feet above where they got a good show of heavy oil on drill stem test in the first hole 45 feet south. Lion Oil Refining Co. has derrick up for a 3,500-foot test in Section 10-17-18, 2 miles east of the Columbia County line, on a 4,000-acre block. Two other small blocks have been assembled in the western part of Union County, L. E. Smith of El Dorado having 1,000 acres in Sections 5 to 10 inclusive and 15 and 18-16-17, in the northeast corner of the county near Mt. Holly, and Sam Arrendale having one centering in Section 18-18-17. E. L. Foster has

begun drilling No. 1 Murphy Land Co. in Section 22-17-17.

H. M. King abandoned No. 1 King, Section 13-10-2e, Urania district of La-Salle Parish, at 1,520 feet.

Mississippi

W. D. Wingfield, of El Dorado, and Hays Brummett and George DeMontrond, who blocked approximately 26,000 acres in the Amory, Monroe County, district of Mississippi on which Arkansas Natural Gas Corp. later drilled No. 1 Rye and got a small gasser, have organized the Mississippi Gas Co. for the purpose of drilling two or three wells on the remainder of their block and expect to get to work before long.

Edwards Oil Syndicate has resumed drilling No. 3 Lewis, Section 12-15-5, Hinds County, where it claimed a show of oil with salt water at 918-23 feet two weeks ago, and is down 1,300 feet. Three other locations, not checked, are reported from this vicinity, another by the Edwards syndicate in Section 36-16-5, Hennese and others in Section 26-16-5, and Big Black Oil Co. in 30-16-4. In the Amory district, Arkansas Natural Gas Corp. has finished cleaning out and straightreaming No. 1 Rye, Section 22-15-17, Monroe County, and is ready to start deepening to 4,500 feet, total depth 2,724 feet. Amory Natural Gas Co. has location for a well, 600 feet north of the discovery well, No. 1 Carter, in Section 7-13-17, and Park Bowser and others will drill in Section 2-12-19. The Amory Development Co.'s No. 1 Bourland, a mile south of Amory, is drilling below 1,500 feet.

NORTH LOUISIANA

Bienville Parish

W. P. Wallace and others' No. 1 Ashley, Section 15-16-10, tested 1,000,000 feet of gas after cementing 6⅝-inch at 1,980 feet and is shut down for orders, total depth 2,005 feet.

DeSoto Parish

P. J. Becker has derrick up in the SW cor. NE NE Section 23-12-15 for No. 1 Tull. Benedum & Trees Oil Co.'s No. 1 State, Section 22-14-12, is coring at 2,790 feet. Carleton Drilling Co. cemented 6⅝-inch at 1,110 feet on No. 2 Stevens, Section 12-11-16, total depth 1,178 feet. Magnolia Petroleum Co. made location 330 feet south and west C of Section 28-12-11 for No. 1 Clements. R. O. Roy cemented 278 feet of 10-inch on No. 1 Sample, Section 1-13-14. Thorn Oil Co.'s No. 1 Burford, Section 22-14-14, is drilling at 1,800 feet. Warren & Carruthers' No. 1 Ramsey, Section 33-13-16, is drilling shale at 2,636 feet.

Bossier Parish

Arkansas Natural Gas Corp.'s No. 1 Tidwell, Section 29-22-11, is drilling at 1,500 feet.

Caddo Parish

D.C.R. Oil Co. is drilling No. 1 Hunter estate, Section 17-19-14, at 150 feet with 10-inch cemented at 86 feet.

Claiborne Parish

Dixie Oil Co. is reaming to bottom on No. 1 F. Gilbert, Section 27-21-5, total depth 4,719 feet.

East Carroll Parish

Palmer Corp. cemented 6-inch at 2,401 Mitchener, Section 8-19-11.

Monroe District

Ouachita Parish—Phillips and others' No. 1 School, Section 16-16-4, is drilling at 3,300 feet.

Union Parish—J. E. Cammatte and others' No. 2 Tugwell, Section 21-22-1e, is drilling at 1,000 feet.

Richland Parish

Richland Operating Co.'s No. 1 Chapman, Section 19-16-7, is drilling at 2,038 feet.

Sabine Parish

R. L. Gay is drilling No. 2 Bowman-Hicks, Section 14-7-14, at 180 feet and No. 1 Sabine Lumber Co., Section 13-7-14, at 2,000 feet.

ARKANSAS

Ashley County

J. G. Marcum and others' No. 1 De-Yampert, Section 5-19-14, shut down at 2,672 feet for the past three weeks, is washing to bottom preparatory to resuming drilling. The Texas Company has begun drilling No. 1 Kiefer, Section 11-18-4.

Bradley County

Ohio Oil Co.'s No. 2 Southern Lumber Co., Section 19-16-9, is drilling at 2,625 feet.

Calhoun County

J. B. Hurley and others are arranging to drill plug from 6-inch casing cemented at 2,125 feet on No. 1 Arkansas Timber Co., Section 29-16-12, total depth 2,314 feet.

Drew County

Ohio Oil Co. has rig up on No. 1 Jerome Hardwood Lumber Co., Section 13-15-4, ready to drill.

Logan County

Arkansas Natural Gas Corp.'s No. 1 Parks, Section 26-8-24, is drilling sandy lime at 3,455 feet.

Miller County

E. A. Martin and others' No. 4 Dale, Section 23-15-26, is shut down at 2,950 feet waiting orders.

Ouachita County

J. E. Crosbie's No. 2 Canada, Section 25-15-16, set 45 feet of 10-inch and is drilling at 650 feet. Charles McDonald has derrick up for No. 1 Wilson, 244 feet north and 135 feet west SE cor. SW NW, Section 25-15-18. Sam Sklar set 185 feet of 10-inch on No. 1 Langley, Section 19-15-15.

Union County

Calgo Oil Co. is coring No. 1 Primm, Section 25-18-15, at 3,658 feet. E. L. Foster set 10-inch at 204 feet on No. 1 Murphy Land Co., Section 22-17-17.

EAST TEXAS

Shelby County

Chapparall Oil Co.'s No. 2 Holt, Matthew Moore Survey, is drilling at 2,810 feet. Gulf Refining Co.'s No. 1 Carraway, J. H. Patterson Survey, is reaming to bottom, total depth 1,600 feet.

MISSISSIPPI

Monroe County

Arkansas Natural Gas Corp. has finished reaming and cleaning out No. 1 Rye, Section 22-15-17, and is ready to begin deepening.

Hinds County

Edwards Oil & Gas Co. is drilling gumbo at 1,280 feet on No. 3 Lewis, Section 12-15-5.

Sharkey County

Atlantic Oil Producing Co. is making hole on No. 1 Houston, Section 30-11-6, after setting a string of 20-inch conductor pipe to case off surface water.

SOUTHWEST TEXAS

(Continued from Page 46)

been completed at 1,474 feet for 60 bbls. daily.

Abandoned Tests

Caldwell County

Gulf Production Co.'s No. 1 Reed, S. Seale Survey, Bruner Field, completed at 2,673 feet dry and abandoned; Edwards topped at 2,630 feet.

J. B. Jarmon's No. 1 Carter, Gerren Hinds, center, has rig moved off and location has been abandoned.

Shell Petroleum Corp.'s No. 1 School Land has been abandoned at 95 feet.

Pat Armstrong's No. 1 E. Martin, A. Floyd Survey, has been abandoned at 2,850 feet, rig still standing.

Neumann & McIntire's No. 1 J. O. Patton, John R. Miller Survey, Lockhart Field, at 2,440 feet is abandoned dry. This well is known by some as Carroll Brown's No. 1 Patton and also as Jake Jarmon's No. 1 Cabiness.

Shell Petroleum Corp.'s No. 1 Wilms, Cornelius Crenshaw Survey, location is abandoned.

Russell-Hill's No. 1 Hill, McCullough Survey, 5 miles north of Lockhart, has been abandoned.

Pat Armstrong's No. 1 Heidenheimer, John R. Miller Survey, Lockhart Field, abandoned location.

Nueces County

R. & G. Corp.'s No. 1 Ed Allen, Ross Peters Subdivision, Agua Dulce Field, has been abandoned dry.

Alexander & Smith's No. 1 Bowers,

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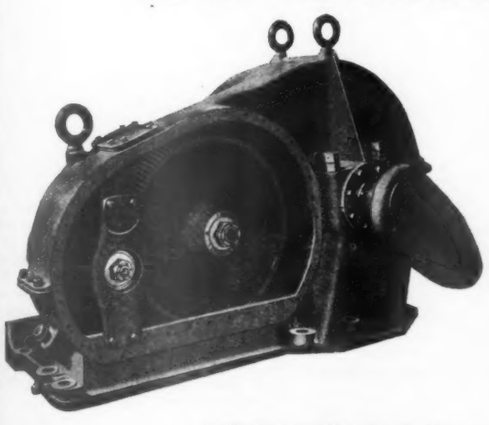

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same field. Richard King Subdivision, Section 47, has been plugged and abandoned at 2,503 feet.

Zapata County

Charles L. McCaslin's No. 1 R. Cuellar, Survey 278, Jennings Field, has been abandoned dry at 1,785 feet.

New Locations

Bastrop County

Jake Jarmon's No. 1 Bennett is moving in machinery.

Caldwell County

J. S. Abercrombie Oil Co.'s No. 5 Lida Moses, A. Floyd Survey, at 2,724 feet, is rigging up to pump.

Gulf Production Co.'s No. 1 Jim Smith, at 2,717 feet, is waiting for standard rig.

Gulf Production Co.'s No. 1 R. W. Carter is spudding in.

Humble Oil & Refining Co.'s No. 1 W. O. Allen has derrick up.

Humble Oil & Refining Co.'s No. 1 Moses & Baggett has derrick up.

Humble Oil & Refining Co.'s No. 4 William Smith has set 12½-inch surface casing at 44 feet.

Shell Petroleum Corp.'s No. 3 Malone is drilling at 2,459 feet with casing set at 2,253 feet.

Shell Petroleum Corp.'s No. 3 William Moses is moving in machinery.

The Texas Company's No. 1 Carter is location.

Bartlett Brothers' No. 2 G. N. Martindale, W. G. Steffey Survey, 750 feet southeast of No. 1, is drilling at 1,622 feet.

Whittington and others' No. 1 J. G. Horner, Francis Berry Survey, is moving in machinery.

J. J. Capps' No. 1 G. W. New, James Hinds Survey, has been spudded in.

Gulf Production Co.'s No. 1 W. O. Allen, Gerren Hinds Survey, is building derrick.

Humble Oil & Refining Co.'s No. 1 Floy Tiller is being completed, estimated good for 50 bbls.

Golden West Oil Co.'s No. 2 Cora Malone, A. Floyd Survey, 50 feet southeast of No. 1, has topped Edwards at 2,712 feet.

Shell Petroleum Co.'s No. 1 Floyd Tiller is waiting for cement at 2,707 feet.

Shell Petroleum Corp.'s No. 1 J. B. Tiller, Gerren Hinds Survey, is being completed.

Shell Petroleum Corp.'s No. 2 J. B. Tiller is being completed.

Duval County

Robert Driscoll's No. 14 Driscoll, Survey 448, located 2,750 feet to east line and 550 feet to south line, has set 10-inch casing at 200 feet and is drilling at 250 feet.

W. F. Morgan's No. 1 Welder-Woods, Survey 102, located 2,725 feet to east line and 750 feet to south line, has derrick up.

Nueces County

R. & G. Corp.'s No. 2 Ed Allen, Lot 5, Section 6, about 1,900 feet east of No. 1, is location.

R. & G. Corp.'s No. 1 Brown, George H. Paul Subdivision, Section 87, is location in center of SE NW.

Refugio County

Houston Oil Co.'s No. 5 Wilson Heard is 300 feet west of No. 1 and moving on machinery.

Travis County

Mid-Kansas Oil & Gas Co.'s No. 1 P. Wolff, G. C. Jennings Survey, is location 150 feet to north and east lines.

Webb County

Edward St. Albans' No. 4 Holbien, Block 7, Share 3, located 150 feet to north and west lines, is moving on.

Magnolia Petroleum Co.'s No. 1 King-Benavides, Survey 694, Block 12, is location 150 feet to south and east lines.

Cole Petroleum Co.'s No. 67 Benavides, Survey 412, Block 4, located 313 feet to east line and 160 feet to north line, is moving on.

Houston Oil Co.'s No. 19-D Benavides, Survey 753, Block 5, is location 666 feet to east line and 160 feet to south line.

Houston Oil Co.'s No. 1 Rosa Benavides, W half SE half Section 701, is location 160 feet to south and east lines.

Humble-Reiter-Foster Pool

Humble Oil & Refining Co.-Reiter-Foster's No. 12 Kohler, Survey 403, located 1,485 feet to south line and 165 feet to east line, is ready to spud in; No. 13 Kohler, Survey 163, located 495 feet to east line and 165 feet to south line, has been spudded in.

Simms Field—Duval

Simms Oil Co.'s No. 3 Dinn, Survey 62, located 660 feet to north and east lines, has sand at 1,761-65 feet and has set casing.

Zapata County

Killam-Duggan's No. 4, Cerrito Blanco grant, Jennings Field, is location.

Schoolfield-O'Byrne Field

Magnolia Petroleum Co.'s No. B-3 Hahl, Survey 61, located 3,081 feet to east line and 150 feet to south line, is testing sand at 2,316-33 feet. Sun Oil Co.'s No. 2 W. P. Norton, Survey 250, Block 19, located 450 feet to east line and 150 feet to south line, tested sand at 2,318-30 feet, which was dry, and is drilling deeper; No. 2 Henne-Winch, Survey 250, Block 20, located 150 feet to north and west lines, is coring for sand. S. & O. Oil Co.'s No. 1 Hahl, Survey 250, Block 23, located 220 feet to north line and 430 feet to west line, tested sand at 2,335-50 feet dry; No. 2 Bowe, Survey 250, Block 21, located 220 feet to east line and 660 feet to south line, has derrick up. Onyx Oil Co.'s No. 3 Krauter, Survey 250, Block 20, located 450 feet to north line and 150 feet to east line, is drilling at 1,000 feet. The Texas Company's No. 2 Hall, Survey 250, Block 18, located 450 feet to north line and 150 feet to west line, has sand at 2,344-48 feet.

Randado Field—Jim Hogg

Magnolia Petroleum Co.'s No. 41 Merchants State Bank, Survey 155, located 150 feet to north and east lines, is drilling at 2,900 feet. Randado Oil Corp.'s No. 29 Palacious, Survey 291, Block 14, has sand at 1,273 feet and set casing; No. 30 Palacious, Survey 291, Block 3, has sand at 1,287 feet and set casing.

Alworth Field

Brooklyn Oil Co.'s No. 2 Garza, Survey 40, Block 16, located 150 feet to northeast lines and northwest lines, is location.

Reiser Field—Webb

Marts & Beavens' No. 2 Johnson, Survey 602, Block 11, located 550 feet to west line and 250 feet to north line, is drilling at 50 feet. W. O. Wheatley's (R. C. Holsworth) No. 1 Wheatley, Survey 1,569, Block 3, located 847.7 feet to north line and 305.2 feet to east line, is drilling at 2,300 feet. Cosner-Danmier's No. 1 D. Benavides, Survey 11, Block 6, located 150 feet to northeast lines and 350 feet to southeast lines, is drilling at 1,360 feet.

Albercas Field

O. W. Killam's No. 33 Bruni, Block 64, is drilling at 700 feet. Sun Oil Co.'s No. 12-A Yeager-Strohman, Share 5, located 4,675 feet to north line and 150 feet to west line, is standing, sand at 2,153-55 feet; No. 13-A Yeager-Strohman, Share 5, located 4,975 feet to north line and 150 feet to west line, is drilling at 1,900 feet. Magnolia Petroleum Co.'s No. 13 Yeager-Strohman, Share 5, located 150 feet to west line and 750 feet to south line, is drilling at 4,544 feet; No. 14 Yeager-Strohman, Share 5, located 900 feet to north line and 575 feet to east line, has derrick up; No. 15 Yeager-Strohman, Share 5, located 1,400 feet to north line and 575 feet to east line, has derrick up. Rycade Oil Corp.'s No. 8 Yeager-Strohman, Share 5, located 1,950 feet to north line and 150 feet to east line, is standing at 2,145 feet. A. M. Major's No. 1 Holbien, Block 6, Share 3, located 150 feet to north and east lines, is location.

Aviation or Bruni Tracts

The Texas Company's No. 1 Bruni, Block 74, located 510 feet to east line and 2,490 feet to south line, is drilling at 1,965 feet.

Carolina-Texas Pool

C. R. Miller's (Miller-Daniels) No. 1 de la Garza, Survey 48, Block 47, located 150 feet to north and east lines, is drilling at 2,165 feet. W. R. Shankle's No. 1 Webster, NE SW, Survey 684, located 150 feet to south and west lines, has sand at 2,015-28 feet. Foster Barnsley's No. 1 Webster, NE SW, Survey 684, located 510 feet to north line and 150 feet to east line, is drilling at 2,200 feet. Barnsley-Scharf-Kirk's No. 2 de la Garza, Survey 335, Block 21, located 200 feet to north line and 150 feet to east line, has sand at 2,026 feet that tested oil on tester.

Magnolia-Cole Field

Houston Oil Co.'s No. 4-D Benavides, Survey 753, Block 13, is location 160 feet to south line and 822.5 feet to east line; No. 17-D Benavides, Survey 753, Block 5, is location 160 feet to south and west lines. Magnolia Petroleum Co.'s No. 1 Benavides, SE SW, Survey 660, located 150 feet to south and west lines, has spudded in; No. 1 Benavides, Survey 697, Block 10, is location 150 feet to north and east lines. Union Exploration Co.'s No. 1 Benavides, Survey 694, Block 3, located 150 feet to south and west lines, is rigging up. W. F. Morgan's No. 1 Benavides, NE SW, Survey 693, located 150 feet to south and west lines, is moving on.

Cole Gas Field

O. W. Killam's No. 1 Bruni, Block 2, located 150 feet to northwest and northeast lines, is rigging up; No. 1 Bruni, Survey 9, located 1,700 feet to northwest lines and 700 feet to northeast lines, has sand at 2,295-2,300 feet and set casing.

Jennings Field—Zapata

O. W. Killam's No. 10 Cuellar, Cerrito Blanco grant, 405 feet to southeast lines and 520 feet to southwest lines, is drilling at 1,100 feet; No. 11 Cuellar, Cerrito Blanco grant, 1,095 feet to southwest lines and 150 feet to southeast lines, is drilling at 1,430 feet. Charles L. McCaslin's No. 1 R. Cuellar, Survey 278, located 3,260 feet to east line and 3,578 feet to north line, is drilling at 1,585 feet; No. 1 R. Hinnant, Survey 74, located 2,390 feet to west line and 630 feet to south line, has derrick up. South Texas Production Co.'s No. 3 Jennings, Cerrito Blanco grant, 9,397 feet to southeast lines and 9,710 feet to southwest lines, is drilling at 190 feet.

Charco Redondo

W. R. Duke's No. 3 Martinez, Block 22, W. R. Duke Subdivision, 1,300 feet to northwest lines and 840 feet to northeast lines, is moving on.

Mirando Valley

O. W. Killam's No. 1-A R. Lopez, Survey 113, Block 5, located 250 feet to west line and 340 feet to north line, has sand at 1,618-30 feet and is drilling at 1,637 feet.

Yoast Field—Bastrop

Atlantic Producing Co.'s No. 2 A. M. Yoast, A. Garcia Survey, 1,950 feet to northwest lines and 150 feet to southeast lines, is testing Serpentine at 1,467 feet. Judge Batts' No. 1 White is drilling at 1,000 feet. Cranfill & Reynolds' (E. B. Germany) No. 1 Stork, H. Stewart Survey, 150 feet to north and east lines, is drilling at 1,760 feet. Gulf Production Co.'s No. 1 A. M. Yoast, A. Garcia Survey, 1,593 feet to northwest lines and 150 feet to northeast lines, is drilling at 985 feet. Sun Oil Co.'s No. 1 A. Yoast, A. Garcia Survey, 1,650 feet to northwest lines and 150 feet to northeast lines, at 1,588 feet total depth, is plugging back to 1,578 feet. The Texas Company's No. 1 A. Yoast, A. Garcia Survey, 450 feet to southwest lines and 150 feet to northwest lines, at 1,577 feet is plugging back to shut out water.

Joe Bruner-Salt Flats Field—Caldwell

Tip De Arman's No. 1 R. W. Carter, Gerren Hinds Survey, 120 feet to west line and 148 feet to north line, at 1,250 feet cratered and gas is still running wild. J. S. Abercrombie Oil Co.'s No. 2 Lida Moses, A. Floyd Survey, 450 feet to west line and 150 feet to north line, is drilling in at 2,733 feet. Brawn and others' (Chief Miller) No. 1 R. W. Carter, Gerren Hinds Survey, 150 feet to south and west lines, is fishing at 2,679 feet. Cranfill & Reynolds' No. 1 S. Smith, A. Floyd Survey, 150 feet to south and west lines, is in Edwards at 2,685 feet. D. F. Bryan's No. 1 Davis, Gerren Hinds Survey, is location. Golden West Oil Co.'s No. 1 Cook, A. Floyd Survey, 480 feet to northeast lines and 170 feet to northwest lines, at 2,763 feet is swabbing water and little oil, oil showing up a little better; No. 6 Wilson, A. Floyd Survey, 300 feet southeast of No. 4, at 2,734 feet total depth is being put on the beam.

Gulf Production Co.'s No. 3 W. L. Smith, 300 feet north of No. 2, is in Edwards at 2,702 feet topped at 2,69[illegible] feet; No. 4 W. L. Smith, 300 feet north of No. 3, at 2,706 feet is waiting on cement; No. 6 W. L. Smith, 300 feet north of No. 5, at 2,690 feet total depth, oil rose 700 feet in half a day; No. 7 W. L. Smith, 300 feet north of No. 6, has derrick up; No. 8 W. L. Smith is drilling at 2,348 feet; No. 1 Connally, A. Floyd Survey, 150 feet to south and west lines, is at 2,264 feet in top of chalk; No. 2 Connally is drilling at 2,330 feet in chalk topped at 2,241 feet; No. 3 J. J. Davis is drilling at 2,534 feet. Guerrin & Gastor's No. 1 Davilla, Isaac Weldon Survey, is location in southeast corner.

Humble Oil & Refining Co.'s No. 2 Mrs. T. B. Johnson, James Hinds Survey, 600 feet west of No. 1, is fishing at 1,070 feet; No. 3 J. B. Tiller is rigging up; No. 4 J. B. Tiller is setting casing at 59 feet; No. 1 J. J. Davis, A. Floyd Survey, 150 feet to north line and 430 feet to west line, is drilling at 2,600 feet; No. 2 J. J. Davis is drilling at 2,695 feet, Edwards topped at 2,687 feet; No. 3 J. J. Davis at 2,288 feet is drilling in the top of chalk and showing oil; No. 1 W. W. Hickman, Gerren Hinds Survey, 150 feet to north and east lines, has steel derrick up; No. 1 William Smith, A. Floyd Survey, 150 feet to south and west lines at 2,685 feet is waiting to drill in; No. 3 William Smith is drilling at 2,58[illegible] feet and showing oil; No. 2 Floyd Tiller, Gerren Hinds Survey, 150 feet to north and west lines, is location. C. E. Lange's No. 1 W. P. Walker, Gerren Hinds Survey, 150 feet to north and west lines, at 2,771 feet in Edwards tested 15 tribles of water and 5 of oil in 15 minutes and is shut down for orders; No. 2 W. P. Walker, Gerren Hinds Survey, 150 feet to west line and 214 feet to south line, is standing at 1,500 feet; No. 1 Kate Colding, A. Floyd Survey, 150 feet to northwest lines and 112 feet to northeast lines, at 2,687 feet shot with 150 quarts at 2,480 feet in chalk and is showing oil.

Lutex Oil, Inc.'s No. 5 W. F. Davis, A. Floyd Survey, 300 feet southwest of No. 2, at 2,703 feet total depth has 1,400 feet of oil in the hole; No. 6 Davis, A. Floyd Survey, at 2,763 feet has 30 quarts of nitroglycerin stuck in the hole above a bridge and is standing. Linderman & Atlantic's No. 2-A W. F. Davis, is drilling in at 2,306 feet. Luling Oil & Gas Co.'s No. 3 Carter at 2,918 feet total depth, is pulling casing and will plug back to test chalk. Speer Well Oil Co.'s (Plum Creek Oil Co.) No. 1 E. L. Mayton, Hector McNeil Survey, in center of survey, is drilling at 2,810 feet. H. C. Ratcliff and others' No. 1 Cora Malone, A. Floyd Survey, 150 feet to north and west lines, is standing at 2,694 feet. Shell Petroleum Corp.'s No. 1-B Carter, Gerren Hinds Survey, 150 feet to south and west lines, has derrick up; No. 1 Malone is location; No. 2 Malone at 2,710 feet is bailing 800 bbls. of oil, 300 bbls. of water; No. 2 William Moses, 300 feet north of No. 1, is moving in rig; No. 3 W. L. Smith, A. Floyd Survey, 150 feet to south and east lines, is deepening at 2,695 feet to Edwards; No. 2 Floyd Tiller is setting surface casing at 53 feet; No. 1 J. Smith, A. Floyd Survey, 150 feet to north and east lines, is drilling at 2,710 feet in Edwards topped 2,704 feet.

Sun Oil Co.'s No. 4 Malone, A. Floyd Survey, 1,033 feet to northwest lines and 150 feet to northeast lines, at 714 feet total depth, is running liner. Stover & May's No. 1 Bell, Luling Survey, Block 24, is location 20 feet to north and west lines; No. 1 Edwards, same survey, Block 5, is location in center of block. The Texas Company's No. 1 Lee Moses, Gerren Hinds Survey, 150 feet to CWL at 2,641 feet, is rigging up to pump; No. 3 Merriweather has derrick up; No. 4 Merriweather, 300 feet north of No. 2, has set casing at 2,419 feet; No. 5 Merriweather, A. Floyd Survey, 150 feet to northeast and southeast lines, has derrick up; No. 6 Merriweather, A. Floyd Survey, 150 feet to northwest lines and 70 feet to northeast lines, has derrick up. M. K. Towns' No. 2 W. W. Hickman, Gerren Hinds Survey, 150 feet to north and west lines, at 2,701 feet is reaming

to set casing; No. 3 W. W. Hickman, A. Floyd Survey, 150 feet to CWL, is drilling at 2,441 feet. S. G. Wagley's No. 1 Gregg, A. Floyd Survey, is location 150 feet to south and west lines.

Lockhart Field

The Texas Company's No. 2-B Branyon, John R. Miller Survey, 1,580 feet to west line and 150 feet to south line, at 2,356 feet total depth, is showing some oil in Edwards topped at 2,346 feet.

Sullivan Field—Gonzales

Cranfill & Reynolds' No. 1 J. F. Webb, Winslow Turner Survey, south offset to discovery well. No. 1 Norwood, is drilling at approximately 1,800 feet.

Luling Pool—Guadalupe

A. B. A. Oil Co.'s No. 4 Britton Harris is standing at 1,250 feet for repairs on boiler. Magnolia Petroleum Co.'s No. 1 M. Schubert, is drilling at 1,580 feet; No. 2-B McKean, H. Cottle Survey, 150 feet to northwest and southwest lines, is drilling at 2,171 feet.

Kingsville Field—Kleberg

Humble Oil & Refining Co.'s No. 4 Flato, Section 40, Block 10, located 250 feet to east line and 450 feet to north line, is drilling at 4,179 feet.

Agua Dulce Field—Nueces

Agua Dulce Oil & Gas Co.'s No. 1 Sanders, Benton's Pasture, 600 feet to north line and 1,980 feet to west line of Section 35, has spudded in and set surface casing. Milam Drilling Co.'s (Davis, Horn and others) No. 1 Thomas Ragland, Manton & Briggs Subdivision, southwest corner Lot 13, is drilling at 1,525 feet.

Saxet Field

Saxet Gas Co.'s No. 5 Dunn is location 1,500 feet southwest of No. 1 Dunn, discovery gas well of the field.

Refugio Field—Refugio

Houston Oil Co.'s No. 1 Blanco River is location. Houston Gulf Gas Co.'s No. 4 J. M. O'Brien, Survey 4, south central part, is spudded in; No. 2 Shelly, Refugio town tracts, is standing at 3,649 feet; No. 1 Fox, Refugio town tracts, is drilling; No. 3 Fox, town tracts, Lot 4, Block 5, center, at 3,300 feet had derrick blown down by wind after well was capped December 22 after running wild; No. 7 James Agnes Lambert, town tracts, is drilling at 4,180 feet in lime. Mission Drilling Co.'s No. 3 Rogers estate, is erecting derrick; No. 1 Nellie B. Cummins, northwest corner of tract, is drilling at 1,600 feet. William M. Morgan's No. 1 Rooke at 3,700 feet is setting casing in preparation to drilling deeper.

William F. Morgan's No. 2 James Agnes Lambert, Tract 8, is shut down at 3,636 feet for repairs. Saxet Gas Co.'s No. 5 Claude Heard, about 550 feet east of No. 4 (location corrected), is bailing at 3,709 feet. Union Exploration Co.'s No. 1 Holmes Heard, Tract 3, Block 8, 150 feet to south and east lines, at 3,695 feet has set casing with sand showing oil and is ready to drill in; No. 2 Leslie Adkins, Block 8, located 150 feet to south and east lines, at 3,669 feet has set casing (number changed to No. 2 from No. 1).

CALIFORNIA FIELDS

(Continued from Page 55)

development of Kettleman Hills, although the Milham Exploration Co. is using gas from the discovery well for boiler fuel in the drilling of No. 1 Beal and No. 2 Elliott. Although practically all the potential productive acreage in the north dome of the Kettleman Hills has been tied up for several months outside leases are still being consummated. During the past few weeks future prospectors have been tying up acreage in the middle dome where the possibility of commercial production is considered favorable. The Shell has become exceptionally active, having recently tied up the west half of Section 8-20-14 and the east half of Section 20-24-19 in Kings County aggregating 640 acres. The Shell also acquired drilling privileges on the SW Section 23-24-18 on a one-eighth royalty. The new Kettleman Hills Field will result in a tremendous increase in the assessed valuation of Kings County and the residents are particularly anxious to cooperate. Kettleman Hills is the first oil field up in Kings County which is between Fresno and Kern Counties, both of which have yielded considerable crude. To facilitate development work in Kettleman Hills, property owners recently petitioned the county supervisors to construct a paved highway into the area.

Lawndale

The Lawndale Field of Los Angeles basin will probably experience one of the most intensive town lot drilling campaigns witnessed in California if everything goes according to schedule. Long Beach, Santa Fe Springs and Huntington Beach all contained subdivided areas which resulted in highly competitive development, but Lawndale will contain more wells per acre provided the axis of the structure lies where geologists have located it and the field shows large production. Only two wells have successfully developed commercial production in the Lawndale Field up to the present and very little is known of the extent and scope of the structure. At least four locations have been staked in the Lawndale Field every day for the past two weeks and projected work is rapidly increasing. Several new wells have already been spudded in and about 10 or 15 more should be making hole within a week. The entire area has become a center of considerable activity resulting from the erection of new rigs and the installation of electric power lines and natural gas lines. The Los Angeles Gas & Electric Co. has been busily laying laterals to many points. The use of natural gas in the development of production at Lawndale will alleviate conditions to some extent at Santa Fe Springs, where excess production has been increasing by leaps and bounds.

Long Beach

There were no developments of unusual interest in the Long Beach Field with the exception of George Langstaff's No. 1 Bixby, an edge well, in the extreme southwestern part of the district. This project, which was rotating a few days ago in a gray sand at 7,225 feet, has logged several minor showings from time to time but nothing of unusual promise. Several completions were chalked up this week, but developments were rather uninteresting. George F. Getty successfully completed No. 26 Long Beach flowing 1,060 bbls. daily from 6,618 feet, the hole having been finished with a 4¾-inch oil string landed on bottom and cemented through perforations at 6,435 feet. The Petroleum Co., which recently listed two large flowing wells on the Beck and Hawkeye leases, has recompleted No. 1 Ifland flowing 2,350 bbls. from 6,786 feet. The output is cutting in excess of pipe line requirements, but may clean up after it has been on production for a few days. The Sovereign Oil Co.'s No. 2 Signal Hill, finished with a 5¾-inch oil string carrying 961 feet of perforated, also registered an excessive water content when given a test at 7,811 feet. The output, 3,495 bbls. daily, is still cutting approximately 25 per cent. Drilling operations in the Long Beach Field are gradually decreasing. There are still 152 wells actually under way, but some of these will probably never be carried into completion while others will show a small initial due to depletion. The Shell is gradually cutting down its development work, but still has a number of deep zone projects scheduled for early completion. The Richfield Oil Co. is nearing the end of its program at Long Beach and while it will list new wells they will be rather few. The Richfield recently placed its third absorption plant in operation at Long Beach and increased its natural gas gasoline capacity to 45,000 bbls. daily. Production of natural gas at Long Beach is still continuing at a relatively high rate and the output will keep plants running to capacity for several months at least as the oil sands are unusually thick, approximating 3,000 feet on top of the structure.

Ventura Avenue

The Pacific Western Oil Co. successfully finished two satisfactory completions in the Ventura Avenue Field early in the week and increased its daily production 5,955 bbls. No. 11 Orton registered an initial daily production of 2,405 bbls. from 6,952 feet, having been finished with an 8⅝-inch landed and cemented at 6,001 feet. This well was followed by No. 15 Orton, which tanked 3,550 bbls. during the initial 24-hour test from 6,535 feet. The Pacific Western also recompleted No. 4 Willett, but the production test has not yet been concluded. The company is starting three new wells on the Orton, Willett and S. P. leases in the southern part of the field, which will probably be spudded in within 10 days. The Bolsa Chica Oil Co. is reaming No. 2 Hartman preparatory to completion and it will probably be finished within 15 days. The Associated and Shell are also expected to list one or more new completions. In the South Mountain Field of Ventura County, The Texas Company finished a small producer when No. 23 Harvey was brought in on the beam doing 176 bbls. of 23.8 gravity oil daily from 3,309 feet.

Rincon

Development work in the Rincon Field, on the western extremity of the Ventura Avenue anticline, has reached a very uninteresting stage due to the unsatisfactory condition of the several shallow zones and the unsuccessful attempt of the Richfield Oil Co. to develop deep zone production. The Richfield is putting its initial deep zone completion on a compressor in an effort to stimulate production at 6,532 feet but the outlook is not encouraging due to mechanical trouble and the small amount of sand present. The Richfield's second deep zone project, No. 1 Hobson, is rotating in an oil sand of undetermined potentiality at 6,515 feet and while the sand encountered is not of sufficient thickness to warrant the hope of developing commercial production it is possible additional drilling may be more successful. Only a few wells are being drilled in the Rincon Field and there is practically no hope of further substantial drilling unless deep zone exploitation is successful.

Midway-Sunset

The Midway-Sunset Field of Kern County, which sprung into the limelight several months ago after long inactivity, has again temporarily passed out of the picture due to the exceptionally slow progress following the discovery of deep zones in Section 8-32-23 and Section 27-32-23. The Republic Petroleum focused attention on the former area by developing substantial production in Section 8-32-23 and the Chanslor-Canfield Midway Oil Co. followed this with satisfactory completions on adjoining acreage in Section 7-32-23. The Republic Petroleum and Chanslor-Canfield Midway Oil are each drilling one well on their respective holdings in Sections 7 and 8 but neither is capitalizing on this deep zone by extensive drilling. The Union subsequently encountered a promising oil sand several miles south of the Republic's holdings but this is still incomplete, footage being held up because of mechanical trouble. Most of the acreage around the Republic and Chanslor-Canfield Midway Oil Co.'s holdings are held in large blocks and drilling has been retarded. The territory immediately adjacent to the Union's discovery is somewhat more susceptible to development and several wells have been started to pick up the sand found by the Union. This work has been unusually slow. The Cypress Petroleum, Italo Petroleum, Shell and Standard are all working on projects with the Union's deep zone as their objective.

Fruitvale

The Pacific Eastern Production Co. finished two new wells in the Fruitvale Field of Kern County and both registered satisfactory production, although the output is still cutting in excess of pipe line restrictions. No. 1 Martin, located in Section 22-29-27, tanked 710 bbls. of 21.5 gravity oil daily from 3,675 feet, the hole having been plugged back from 3,788 feet because of bottom water. No. 7-B, also located in Section 22, showed 600 bbls. daily from 3,627 feet, the hole having been plugged back from 3,736 feet because of the same water sand which was encountered in No. 1 Martin. The Shell apparently has a duster in No. 1 Kern County Land Co., located in Section 9-29-27, as the bit in this hole has passed the 5,040-foot mark without picking up the Pacific Eastern sand. The next completion at Fruitvale will probably be the Mohawk Oil Co.'s No. 2 in Section 27, as the oil string is being run in. George F. Getty has suspended drilling operations in No. 1 Farrel in Section 21-29-27 and the suspension is expected to be for an indefinite period.

Kern River

Completions in the Kern River Field during the past few months have been considerably less due to the restriction of drilling operations. The oil from this field is exceptionally heavy and operators are experiencing difficulty in disposing of it. The West Front section was arbitrarily shut in for several months during 1928, but several operators were subsequently obliged to resume production due to insistence of property owners. Many leases require continuous drilling until maximum development had been achieved, but since this work would have kept production at a relatively high rate and further weakened the status of the already unstable fuel oil market, operators have slowed up development work and immediately shut in new wells. In many instances drilling projects located in proven territory were carried down to the top of the pay and drilling operations suspended indefinitely. This condition will result in the completion of a relatively large number of new wells within a short period when production activities are resumed, as it will require but a few days to drill into the pay and run in the oil string. Two new producers were finished out on the West Front and both were given preliminary production tests before being shut in. The Associated's No. 54, located in Section 23-28-27, registered an initial daily production of 285 bbls. from 2,240 feet, while the Chanslor-Canfield Midway Oil Co.'s No. 11 in Section 23-28-27 pumped 179 bbls. daily from 2,311 feet.

Mount Poso

Although there is no way of moving oil out of the Mount Poso Field of Kern County, operators are still engaged in a rather comprehensive development program. This work, while it has resulted in the extension of the outer limits of

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	.....	585,168
Diesel and gas oil	75,250	10,750	172,500	24,643	247,750	72,180
Gasoline	147,829	21,118	353,368	50,481	1,091,372	632,962
Coastwise—						
Crude oil	547,548	78,221	455,450	65,064	1,558,152	946,427
Fuel oil	338,071	48,296	472,899	67,557	1,039,986	1,229,287
Diesel and gas oil	17,556	2,508	10,430	1,490	64,023	170,299
Gasoline	157,056	22,437	256,347	36,621	781,902	775,711
Kerosene	461	66	678	97	1,139	11,531
Naphtha distillate	.....	.....	.....	.....	.....	30,500
Exports—						
Crude oil	.....	.....	144,903	20,700	144,903	108,678
Fuel oil	502,353	71,765	378,244	53,321	1,339,624	2,025,261
Diesel and gas oil	.....	.....	100,020	14,289	165,160	162,773
Gasoline	267,287	38,184	308,614	44,088	886,898	358,434
Kerosene	47,632	6,805	7,759	1,108	152,031	225,369

TANKER SHIPMENTS, SAN FRANCISCO TO ATLANTIC AND GULF COAST PORTS

Diesel and gas oil	.....	.....	.....	.....	.....	93,515
Gasoline	.....	.....	75,820	10,831	153,694	154,238
Coastwise—						
Fuel oil	139,817	19,974	.....	.....	139,817	360,980
Diesel and gas oil	.....	.....	.....	.....	.....	1,478
Gasoline	137,711	19,673	50,168	7,167	276,951	171,185
Kerosene	.....	.....	.....	.....	4,280	29,862
Exports—						
Crude oil	71,453	10,208	.....	.....	71,453	20,073
Fuel oil	.....	.....	.....	.....	.....	333,325
Diesel and gas oil	52,869	7,553	.....	.....	52,869	.....
Gasoline	.....	.....	307,813	43,977	458,790	341,860
Kerosene	.....	.....	68,030	9,719	68,030	80,391
Lubricants	13,693	1,956	.....	.....	13,693	.....

production in several instances, will not have any effect on state production as the oil is a heavy unrefinable crude unsuited for refining purposes and cannot be marketed. There were no producers finished during the week with several potential producers should be completed soon. These wells will be shut in upon completion. Drilling operations in practically all of the older fields of the San Joaquin Basin have been at a standstill for some time, although spasmodic development has been productive of new completions at infrequent intervals. The last two wells finished in the McKittrick Field were chalked up by the Franco Western Oil Co. and H. B. Porter. The former's No. 10 in Section 8-30-22 was good for 85 bbls. daily from 2,477 feet, while the latter's No. 1 in Section 26-29-21 came in on the beam doing 200 bbls. per day from 1,219 feet. The Belridge Field of Kern County has been witnessing a slow but continuous development campaign involving several properties which yield a heavy oil at shallow depths. This work has not had any effect on production as these wells are shut in immediately.

MICHIGAN FIELDS

(Continued from Page 56)

Montague well, SW SW Section 21-12-17, Montague Township, was dry at 1,700 feet in the upper Traverse pay but will be drilled to the Dundee.

Western Michigan Wildcats

Two Western Michigan wildcats have a hole full of salt water after drilling into the upper Traverse pay sands and one has bailer in the hole besides.

Paul Schulte's No. 1 Blanchard, SW SW Section 30-10-10, Nelson Township, Kent County, struck water at 2,485 feet and had to pull casing to remove a bailer. It will be drilled to the Dundee.

Edward DuVall's No. 2 Carrie Mears, SW NW Section 31-15-18, Golden Township, Oceana County, struck salt water at 1,589 feet and may be drilled to the Dundee.

Oceana County

A fund of $125,000 to make structure tests and to drill deep tests in Oceana County adjoining Muskegon County on the north has been set aside by the Muskegon Oil Corp. and five associated companies.

The first structure test already has been started on the property of William Kinster, SE SW Section 17-13-17, Grant Township, Oceana County. A rig for the first deep test will be moved to a location in Shelby Township.

KANSAS FIELDS

(Continued from Page 44)

Block 46, SW cor. SE SW, Section 10-31-10, is rigging up. Denton Brothers' No. 3 Elston, NW cor. NE NW, Section 15-31-10, is spudding. Sharkey & Ames' No. 1 Moline Townsite, Block 45, Lot 7, SW cor. SE SW, Section 10-31-10, made a 20-bbl. well in sand at 1,980-2,011 feet.

Ellis County

Phillips Petroleum Co. made location for No. 1 Dechant, NE cor. SE, Section 12-13-16w.

Greenwood County

Phillips Petroleum Co. made location for No. 4 Green, SW cor. NW NE, Section 11-22-10. Empire Oil & Refining Co. made location for No. 11 Edwards, SW cor. NE, Section 21-23-11. Mohawk Oil Co.'s No. 4 Grundy, SW cor. SE NW, Section 7-27-11, made 100 bbls. from sand 1,876-92 feet. The Prairie Oil & Gas Co. and others' No. 1 Smith, NW cor. NE NE, Section 6-24-12, has been abandoned at 1,887 feet. Empire Oil & Refining Co.'s No. 15-A Schwab, SE cor. SW NE, Section 25-22-12, made 15 bbls. from sand at 1,710-27 feet. Pryor & Lockhart and White Eagle Oil & Refining Co.'s No. 3 Wenzler, SW cor. SE NW, Section 29-22-13, is dry and abandoned at 1,818 feet.

Marion County

Empire Oil & Refining Co.'s No. 1 Burket, SE cor. NE NE, Section 11-20-3, is dry and abandoned at 2,609 feet.

Sedgwick County

Phillips Petroleum Co. made location for No. 1 Dufford, NW cor. NE NE, Section 1-26-1w, Valley Center area. Betty Brown Oil Co. made location for No. 1 Davis, NW cor. NE NW, Section 5-26-1. Mary Jane Oil Co. has the rig up for No. 2 Fitch, SW cor. NE SE SW, Section 6-26-1. Tidal Oil Co. has built the rig for No. 1 Scherger, SE cor. SW NW, Section 6-26-1. The rig is also up for No. 2 Scherger, NW cor. SW NW, Section 6-26-1. Jones and others made location for No. 1 Brown, NW cor. Section 6-26-1. Bu-Vi-Bar Petroleum Co. and others made location for No. 1 Emerich, CWL SE SW, Section 6-26-1. Location was also made for No. 1 Branch, C W half SE SW, Section 6-26-1. Allison & Fitzwilliams made location for No. 1 Kelly, SE cor. SW NW NW, Section 6-26-1. Bu-Vi-Bar Petroleum Co. made location for No. 1 Wilson, CSL SW, Section 12-25-1w. Marland Oil Co. has the rig up for No. 2 Goodrich, NW cor. NE SW, Section 16-25-1. H. H. Patton has built the rig for No. 1 Valley Center, SW cor. NW SW NW, Section 31-25-1.

OKLAHOMA FIELDS

(Continued from Page 44)

tion was made for No. 1 Emmerson, NE cor. Section 25-11-3w. Location was made for No. 1 Button, SW cor. Section 19-11-2w. Location was made for No. 2 Button, SW cor. NW SW, Section 19-11-2w. Indian Territory Illuminating Oil Co. and others made location for No. 1 Uzzell, SW cor. NW, Section 19-11-2w. T. B. Slick has the rig on the ground for No. 1 Huddlestone, SW cor. SE, Section 19-11-2w. Sinclair Oil & Gas Co. made location for No. 1 Stamper, NW cor. SW NW, Section 30-11-2w. Sinclair Oil & Gas Co. and Amerada Petroleum Corp. made location for No. 1 Foster, NW cor. SE, Section 30-11-2w. Indian Territory Illuminating Oil Co. made location for No. 1 S. Bodine, NW cor. Section 30-11-2w. Indian Territory Illuminating Oil Co.'s No. 1 Park, C SE SE, Section 24-11-3w, Oklahoma City Pool, discovery well, was completed for 6,564 bbls. in Hunton lime at 6,356-98 feet.

Okfuskee County

A. B. Ice has the rig up for No. 1 Smith, NE cor. NW, Section 35-11-11. Ash and others made location for No. 1 Barnett, NW cor. NE NW, Section 6-10-12. C. L. McMahon and others' No. 2 Hall, SW cor. SE NE, Section 29-12-10, has been completed for 75 bbls. in sand at 3,138-52 feet. Josey Oil Co.'s No. 12 McCoy, NE cor. NW SW, Section 33-12-11, is dry and abandoned at 3,057 feet. Burk Greis Oil Co.'s No. 2 Unallotted, SW cor. NE SW, Section 36-11-9, came in for 56,000,000 feet of gas in sand at 3,601-30 feet. Champlin Oil & Refining Co.'s No. 1 W. Washington, SW cor. NW SE, Section 15-11-11, has been completed for 100 bbls. in sand at 3,480-3,504 feet.

Okmulgee County

Empire Oil & Refining Co. made location for No. 1 Sharp, CEL SW SW, Section 29-14-12. Rounsaville and others' No. 4 Rentie, CSL NE SE, Section 30-12-12, is preparing to deepen. Aiken Oil Co. and others' rig is up for No. 2 S. Fox, CEL SE NW, Section 22-13-14. J. K. Gardner and others' No. 2 J. Fixico, CSL NW SE, Section 9-14-13, made 20 bbls. from sand at 1,127-74 feet. Aiken Oil Co. and others' No. 4 S. Fox, NW cor. NE SE NW, Section 22-13-14, was completed for 500 bbls. in sand at 2,290-92 feet.

Osage County

Lewis Production Co. and others' No. 3, SE cor. NE SE, Section 15-26-6, is a rig under construction. Wrightsman Petroleum Co. made location for No. 1, SE cor. NW, Section 13-26-7. Silurian Oil Co. made location for No. 1, SW cor. NE, Section 12-23-11. L. G. Stanley is moving a machine in for No. 5, NW cor. SW SE, Section 36-22-8.

Lewis Production Co. and others' No. 1, SW cor. Section 14-26-6, made 117 bbls. in 17 hours from Burbank sand at 2,968-91 feet. No. 2, NW cor. SW, Section 14-26-6, was completed for 125 bbls. in Burbank sand at 2,988-92 feet. The Texas Company's No. 1, SW cor. NW SE, Section 30-25-8, made 220 bbls. from Burgess sand at 2,405-2,954 feet. A. G. Oliphant's No. 1, NW cor. NE, Section 6-23-9, flowed 180 bbls. from Bartlesville sand at 2,136-70 feet. L. G. Stanley's No. 4, NW cor. SW SE, Section 36-22-8, made 75 bbls. on the pump from sand at 443-460 feet.

Pawnee County

Superior Oil Co. and Swift's No. 1 Cole, CNL NE NW, Section 34-20-9, is a machine rigging up. Kennedy & Horner's No. 2 Kender, C NE NE, Section 13-20-9, is dry and abandoned at 2,806 feet.

Payne County

Pure Oil Co.'s No. 3 Axtell, NW cor. SW, Section 8-18-4, has been completed for 115 bbls. in sand at 4,281-97 feet.

Pontotoc County

Sunray Oil Co. made location for No. 2 S. Nitchey, SE cor. NW NE, Section 19-5-8, Allen Pool. Boucher Oil & Gas Co. made location for No. 1 Sarkey, C SW SE, Section 23-4-7.

Pottawatomie County

The Texas Company has the cellar dug for No. 6 Calvin, SE cor. SW SE, Section 7-8-5, Maud Pool. No. 7 Calvin, SW cor. SE SE, Section 7-8-5, is also a cellar. Mid-Continent Petroleum Corp. has the rig on the ground for No. 2 Shelton, NW cor. NE NE, Section 18-8-5. Skelly Oil Co. and Margay Oil Co.'s cellar is dug for No. 3 Linger, NE cor. NW NE, Section 18-8-5. Magnolia Petroleum Co. made location for No. 2 Banta, NE cor. SE SE, Section 14-7-4, St. Louis Pool. Location was also made for No. 3 Banta, NE cor. SE, Section 14-7-4. T. B. Slick and Magnolia Petroleum Co. moved the rig out for No. 1 Rowe, NE cor. SW, Section 18-7-5.

Magnolia Petroleum Co. has the rig on the ground for No. 1 I. Rowe, NW cor. NE SW, Section 18-7-5. The rig is also on the location for No. 3 Brandenburg, SE cor. NW NW, Section 18-7-5. Sinclair Oil & Gas Co. has the rig on the ground for No. 4 Nesbit, SW cor. NE NW, Section 18-7-5. Location has been made for No. 5 Nesbit, SE cor. NE NW, Section 18-7-5. No. 6 Nesbit, NE cor. NW, Section 18-7-5, is also a location. T. B. Slick and Maud Oil & Gas Co.'s No. 5 Davis, SE cor. NW NE, Section 18-7-5, is a cellar. No. 6 Davis, SW cor. NE, Section 18-7-5, is also a cellar.

Atlantic Oil Producing Co. and Phillips Petroleum Co.'s No. 1 Bank, SW cor. NE NE, Section 11-9-4, is dry and abandoned at 4,670 feet in Wilcox sand. Independent Oil & Gas Co.'s No. 1 Harding, SE cor. NW, Section 18-8-5, Maud Pool, was completed for 3,655 bbls. in Misner sand at 4,169-97 feet.

Pure Oil Co.'s No. 1 Lindley, SE cor. SW SE, Section 18-8-5, made 1,200 bbls. from Misner sand at 4,098-4,125 feet after deepening. Phillips Petroleum Co.'s No. 1 Hudson, NE cor. NW, Section 19-8-5, flowed 1,072 bbls. from Misner sand at 4,240-68 feet. Magnolia Petroleum Co.'s No. 2 Clour, NE cor. SE, Section 11-7-4, swabbed 56 bbls. from Simpson sand at 4,320-28 feet. No. 1 M. Wilbarn, NE cor. NW SE, Section 24-7-4, pumped 5 bbls. from Simpson sand at 4,425-70 feet. No. 4 Wilbarn, NW cor. SW SE, Section 24-7-4, swabbed 62 bbls. from Simpson sand at 4,380-4,422 feet.

Seminole County

Sinclair Oil & Gas Co. has the cellar dug for No. 1 Alexander, SE cor. Section 36-10-5, Earlsboro Pool. Independent Oil & Gas Co. moved the rig out for No. 2 Alexander, SW cor. Section 31-10-6. Burke Greis Oil Co.'s No. 3 Mayes, NE cor. Section 1-9-5, is a cellar. Carter Oil Co. made location for No. 1 Coker, SE cor. SW, Section 2-8-5, Mission area. Empire Oil & Refining Co. has the rig on the ground for No. 4 Cluck, NW cor. SW NE, Section 11-8-5. Magnolia Petroleum Co. made location for No. 1 Mitchell, SW cor. SE SE, Section 24-8-5. Location was made for No. 1 Thompson, NW cor. NE NE, Section 18-7-6, Little River area. The Texas Company has the rig on the ground for No. 1 Lucy, SW cor. SE SE, Section 18-5-8, Maud Pool.

T. B. Slick and Skelly Oil Co.'s No. 3 Campbell, SW cor. NW NE, Section 6-9-6, Earlsboro Pool, drilled to 4,351 feet in Wilcox sand and plugged back to 4,338 feet where it made 385 bbls. No. 5 Campbell, SE cor. NE NW, Section 6-9-6, was completed for 2,749 bbls. in Misner sand at 4,108-38 feet. T. B. Slick's No. 2 James, NW cor. SE SW, Section 6-9-6, swabbed 589 bbls. from sand at 4,379-96 feet. No. 3 James, NE cor. SE SW, Section 6-9-6, made 867 bbls. from Wilcox sand at 4,291-4,316 feet. Skelly Oil Co. and Atlantic Oil Producing Co.'s No. 2 Sherry, NW cor. SW, Section 6-9-6, made 457 bbls. from Wilcox sand at 4,373-92 feet.

Skelly Oil Co.'s No. 2 Shepherd, SE cor. SW NW, Section 6-9-6, had Wilcox sand at 4,318-36 feet, and made 873 bbls. Phillips Petroleum Co.'s No. 1 Keenan, SE cor. Section 6-8-5, is dry and abandoned at 4,476 feet in Wilcox sand. Gypsy Oil Co.'s No. 1 Coker, NE cor. SE, Section 10-8-5, flowed 900 bbls. from Simpson sand at 4,236-63 feet. The Texas Company's No. 6 Janey, SE cor. NW SW, Section 11-7-6, Little River Pool, was completed for 130 bbls. in Wilcox sand at 4,408-35 feet. Carter Oil Co.'s No. 4 M. Harjo, SE cor. NW SW, Section 13-7-6, produced 2,600 bbls. from Wilcox sand at 4,395-4,403 feet. Tidal Oil Co.'s No. 1 Harrison, SW cor. Section 2-7-7, is dry and abandoned at 4,725 feet.

Stephens County

Magnolia Petroleum Co. made location for No. 20 Kagay, SE cor. SW SE SW, Section 34-1s-8w. Clark & Cowden's No. 3 Davidson, NW cor. SW SW, Section 13-1s-4w, is a rig under construction. No. 8 M. Green, SW cor. NW NW, Section 13-1s-4w, is material on the ground. Ven-Mex and Mid-Continent Oil Co.'s rig is up for No. 5 Bush, SE cor. NW NE NW, Section 3-2s-8w. Amerada Petroleum Corp. and Amos Drilling Co. made location for No. 1 Richard, SW cor. NE NE, Section 19-2s-4w.

Saterwood & Hart's No. 2 Farrout, NE cor. NW, Section 9-1s-8w, has been abandoned at 2,506 feet. Roy Carter and others' No. 1 Simpson, NE cor. SE SE SE, Section 34-1s-8w, is dry and abandoned at 1,940 feet. No. 6 Simpson, NW cor. SW SW SE, Section 34-1s-8w, is a dry hole at 1,736 feet. Mudge Oil Co.'s No. 8 Cobb "A," SE cor. NW NW NE, Section 1-2s-5w, made 6 bbls. in sand at 688-702 feet.

Tulsa County

Munn Brothers' No. 2 Wray, CWL SW NW, Section 35-19-13, is dry and abandoned at 2,052 feet.

Texas County

Skaer and others are moving in tools for No. 1 Hitch, NW cor. Section 25-1-15ecm.

Lattimer County

LeFlore Gas & Electric Co.'s No. 1 Cutler, NW cor. NE SE, Section 17-6-21, is dry and abandoned at 2,673 feet.

Logan County

Shell Petroleum Corp.'s No. 2 Freelove, NW cor. SW SW, Section 17-19-4w, was completed for 358 bbls. in Wilcox sand at 6,116-27 feet.

Muskogee County

Colton & Lester and others moved a machine to the location for No. 1 Parker, C NW SW, Section 31-12-19. R. & R. Drilling Co.'s No. 1 Ragan, NE cor. Section 19-13-16, made 30 bbls. from sand at 2,140-60 feet.

Wagoner County

Oklahoma Natural Gas Co. has a machine on the location for No. 3 Cinda, NW cor. SW, Section 22-18-17. Elk Drilling Co.'s No. 4 Childers, SE cor. NW SE, Section 29-18-17, is spudding. Public Service Corp.'s No. 1 Brown, NW cor. SW, Section 36-16-17, is drilling at 780 feet. C. F. Finefield and others' No. 1 Wofford, NW cor. SW SW, Section 22-16-19, is spudding. Elk Drilling Co.'s No. 3 Childers, SW cor. NE SE, Section 29-18-17, has been completed for 750,000 feet of gas in sand at 422-42 feet.

Seminole Production

The production of the Little River, Maud, Mission, Bowlegs and Earlsboro Pools of the Greater Seminole region on Thursday, January 10, follows:

Little River Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Nitey	2- 7-6	3	595
Amerada-Wilcox:			
Fore	35- 8-6	2	433
Barnsdall:			
Cotcha	23- 7-6	2	1,600
Hotulke	22- 7-6	2	190
Walker	4- 7-6	1	484
Blackwell:			
Baker	11- 7-6	4	1,847
Nitey	35- 8-6	6	2,217
Talley	14- 7-6	4	1,388

Bryan & Emery:				
Walker	4- 7-6	1	13	
Carter:				
Cotcha, M.	23- 7-6	3	345	
Cudjo, L.	23- 7-6	2	420	
Fish	36- 8-6	4	350	
Harjo, C.	11- 7-6	3	4,177	
Harjo, M.	13- 7-6	3	3,457	
Jackson	11- 7-6	4	1,240	
Larney	24- 7-6	4	3,211	
Lena	10- 7-6	1	475	
Moore	11- 7-6	2	650	
Tewee	14- 7-6	6	2,360	
Thomas	11- 7-6	1	195	
Wilson	12- 7-6	2	322	
Champlin:				
Tewee	14- 7-6	2	877	
Continental:				
Cosar	36- 8-6	7	1,805	
Cosar, M.	25- 8-6	1	370	
Continental & Fisher:				
Milsey	11- 7-6	2	425	
Empire:				
Charty	24- 7-6	1	60	
Coker	13- 7-6	1	607	
Sandlin	3- 7-6	1	15	
Gypsy:				
Brown, C.	33- 8-6	2	312	
Brown, M.	33- 8-6	1	1,025	
Campbell	33- 7-6	2	60	
Conard	22- 7-6	2	447	
Cosar, M.	25- 8-6	1	....	
Cosar, W.	36- 8-6	2	97	
Cotcha	23- 7-6	7	1,935	
Denmark	11- 7-6	4	1,372	
Hulhoke	14- 7-6	10	1,892	
Mungee	1- 7-6	1	7	
Payne	5- 7-7	1	15	
Puttie	35- 8-6	4	1,722	
Renton	11- 7-6	3	455	
Independent:				
Davis, R.	13- 7-6	4	2,735	
Tewee	14- 7-6	6	1,825	
Williams	15- 7-6	1	460	
Independent & Highway:				
Harris	23- 7-6	8	3,030	
Independent & White Eagle:				
Davis	2- 7-6	4	375	
I. T. I. O.:				
Campbell	1- 7-6	1	123	
Dungan	35- 8-6	3	506	
House, M. A.	1- 7-6	1	41	
House, W. E.	1- 7-6	1	22	
House "B"	2- 7-6	4	1,828	
Hull	26- 8-6	3	307	
Jackson	1- 7-6	3	458	
McCulla	1- 7-6	3	167	
Nitey	2- 7-6	6	194	
Phoebe "A"	36- 8-6	2	70	
Phoebe "B"	36- 8-6	3	108	
Reed	1- 7-6	1	16	
Sokethecke	1- 7-6	3	591	
Magnolia:				
Cruse	2- 7-6	4	283	
Denby	11- 7-6	4	320	
Dixon	31- 8-7	1	2	
Harjo, A.	14- 7-6	2	80	
Harjo, B.	14- 7-6	2	384	
Puttie	35- 8-6	4	300	
Reed, E.	31- 8-7	1	24	
Reed, I.	22- 7-6	3	528	
Marland & Shaffer:				
Harrison	4- 7-7	1	580	
McCulloch & Sands:				
Harrison	4- 7-6	1	18	
Mid-Continent:				
Brunner	11- 7-6	4	525	
Eleck	23- 7-6	1	110	
Smith	5- 7-7	2	3,485	
Wadsworth	36- 8-6	7	530	
W. B. Pine:				
Hoyecha	26- 8-6	6	1,788	
Pine-Phillips:				
Puttie	35- 8-6	2	648	
Prairie:				
Chilcoat	25- 8-6	3	475	
Dungan	35- 8-6	1	....	
Gibson	14- 7-6	5	1,710	
Harris	14- 7-6	4	1,265	
House	2- 7-6	4	210	
Johnson	24- 7-6	1	510	
Lustey	5- 7-7	1	....	
Moopin	24- 7-6	2	2,265	
Talley	14- 7-6	4	1,165	
Prairie & Amerada:				
Sunny	14- 7-6	7	4,135	
Pure:				
Bronson	24- 7-6	2	800	
Cotcha	14- 7-6	10	3,089	
Harjo	11- 7-6	4	1,119	
Hollins	11- 7-6	1	263	
Reiter-Foster:				
Bunyard	14- 7-6	4	1,320	
Shaffer:				
Narcome	36- 8-6	2	100	
Shell:				
Caesar	11- 7-6	1	15	
Hotulke	23- 7-6	4	344	
Jeffries	32- 8-7	1	50	
Johnson	13- 7-6	4	2,532	
Sinclair:				
Cosar	30- 8-6	3	1,055	
Haney	12- 7-6	1	62	
Tewee	14- 7-6	2	1,350	
Sinclair & Kingwood:				
Pompey	24- 7-6	1	100	
Skelly:				
Carl	14- 7-6	2	157	
Slick:				
Chilcoat	2- 7-6	1	15	
Reed	13- 7-6	2	2,300	
Williams	15- 7-6	2	1,085	
Wood	26- 7-6	2	380	
Slick & Pine:				
Coker	1- 7-6	1	390	
Snowden-McSweeney:				
Tiger	13- 7-6	3	760	
Sinerior:				
Potatika	31- 8-6	1	....	
Sokethecke	1- 7-6	1	....	
Texas:				
Brooks	25- 8-6	1	45	
Coker	1- 7-6	3	295	
Janey	11- 7-6	4	680	
Texas & Independent:				
Hotulke	23- 7-6	4	965	
Hotulke	22- 7-6	1	256	
Tidal:				
House	1- 7-6	2	390	
Johnson	1- 7-6	1	77	
Twin States:				
Lowe	25- 8-6	1	1,128	
Wigdon & Long:				
Jefferson	31- 7-6	1	30	
Total		322	92,696	

Maud Pool

Amerada:				
Goosland	8- 8-5	1	660	
Gravel	1- 8-4	1	....	
Hallum	1- 8-4	1	2,420	
Amerada & Hull:				
Green	20- 8-5	1	1,600	
Barnsdall:				
Coker	11- 8-5	1	2,035	
Pipe	14- 8-5	1	1,130	
Darby:				
Ketchum	19- 8-5	..	351	
Empire:				
Cluck	11- 8-5	..	....	
Gypsy:				
Bourassa	7- 8-5	1	....	
Coker	10- 8-5	..	125	
Miller	18- 8-5	..	760	
Independent & Harding:				
Miller	18- 8-5	1	2,350	
I. T. I. O.:				
Simpson	10- 8-5	1	210	
State	16- 8-5	1	....	
Phillips et al:				
Hudson	19- 8-5	1	755	
Pure:				
Lindly	18- 8-5	3	3,631	
Prairie:				
Billington	11- 8-5	2	1,630	
Campbell	18- 8-5	2	2,610	
Sinclair:				
Bellars	19- 8-5	3	3,150	
Harjo	11- 8-5	1	1,374	
Skelly & Margay:				
Lingenfelt	18- 8-5	1	2,122	
Slick & White Eagle:				
Villines	20- 8-5	1	65	
Sunray & Call-Cul:				
Davis	19- 8-5	1	185	
Total		30	27,303	

Mission Pool

Carter:				
Fuswa	18- 8-6	1	50	
Micco	8- 8-6	1	....	
Gypsy:				
Baby	6- 8-6	1	15	
Barkus	6- 8-6	2	....	
Dosar	7- 8-6	1	367	
Hardy	7- 8-6	1	....	
Mission	5- 8-6	1	....	
Mosar	1- 8-5	1	....	
Marland:				
Maines	7- 8-6	1	....	
Mid-Kansas:				
Moore	7- 8-6	1	....	
Shell & Marland:				
Herndon	7- 8-6	1	....	
Shell & Papoose:				
Maines	7- 8-6	1	....	
Twin States:				
Hayes	8- 8-6	1	50	
Total		14	472	

Bowlegs Pool

Amerada:				
Roscoe	15- 8-6	7	1,060	
Atlantic:				
Baker	10- 8-6	4	265	
Fleet	23- 8-6	3	250	
Grayson	13- 8-6	4	560	
Jones, A.	16- 8-6	2	....	
Jones, C.	9- 8-6	1	140	
Barnsdall:				
McNac	28- 8-6	1	22	
Murrow	11- 8-6	4	401	
Carter Oil:				
Bowlegs	15- 8-6	4	657	
Burden	23- 8-6	2	227	
Harjoche	14- 8-6	6	672	
Hilly	23- 8-6	3	365	
Jones	11- 8-6	4	347	
Walker	15- 8-6	4	585	
Wise	23- 8-6	11	1,762	
Dixie:				
Culley	11- 8-6	1	90	
Empire:				
Lacy	14- 8-6	6	482	
Wise	23- 8-6	2	215	
Gypsy:				
Bowlegs	22- 8-6	1	220	
Bradley	9- 8-6	1	3	
Cumsey	10- 8-6	4	792	
Grayson	13- 8-6	4	510	
Harjoche	10- 8-6	3	582	
Jones	11- 8-6	1	7	
Walker	15- 8-6	7	922	
Wise	23- 8-6	2	230	
I. T. I. O.:				
Barnett	24- 8-6	2	221	
Barnett "B"	23- 8-6	1	97	
Billington	22- 8-6	5	199	
Bowlegs	22- 8-6	10	1,562	
Davis	13- 8-6	4	463	
Fay	13- 8-6	9	1,458	
Goforth	15- 8-6	12	1,452	
Livingstone	15- 8-6	10	1,759	
Lizzie	13- 8-6	3	226	
Walker	15- 8-6	8	861	
Williams	12- 8-6	1	210	
Wilmott	15- 8-6	4	355	
Work	24- 8-6	1	43	
Youngblood	24- 8-6	2	108	
Magnolia:				
Davis	13- 8-6	3	457	
Davis, M.	13- 8-6	1	175	
Hammond	10- 8-6	8	695	
Rhodos	12- 8-6	5	764	
Van Buskirk	9- 8-6	2	540	
McCulloch:				
Bowlegs	22- 8-6	2	230	
Mid-Continent:				
Baker	10- 8-6	4	395	
Bowlegs	22- 8-6	1	5	
Smith	12- 8-6	6	550	
Minnehoma:				
Bowlegs	15- 8-6	4	264	
Prairie:				
Gahagan	23- 8-6	3	435	
Harber	10- 8-6	8	2,040	
Jones	11- 8-6	4	325	
Templeton	12- 8-6	5	1,880	
Whitney	23- 8-6	4	665	
Pure Oil:				
Reed	14- 8-6	14	2,531	
Strothers "D" 11 &	14- 8-6	4	485	
Strother "F"	10- 8-6	7	2,413	
Roxana:				
Taylor	16- 8-6	5	50	
Shaffer:				
Lacy	14- 8-6	3	370	
Sinclair:				
Cumsey	10- 8-6	4	625	
Ellen	11- 8-6	6	900	
Harjo	14- 8-6	3	1,032	
Jones	9- 8-6	7	560	
Taylor	10- 8-6	4	660	
Taylor, W.	10- 8-6	3	650	
Walker	22- 8-6	4	1,090	
Slick:				
Jones	3- 8-6	1	370	
Texas:				
Reed	14- 8-6	11	970	
Tidal:				
Grayson	13- 8-6	4	420	
Harjoche	10- 8-6	6	1,125	
Twin States:				
Jones	11- 8-6	1	....	
Total		312	44,051	

Earlsboro Pool

Amerada:				
Anderson	15- 9-5	2	397	
Cowden	4- 9-5	7	1,021	
Rogers	3- 9-5	2	77	
Atlantic & Gypsy:				
Delaware	13- 9-4	1	....	
Atlantic & Sinclair:				
Foreman	18- 9-5	1	139	
Barnsdall:				
Brown	10- 9-5	4	1,067	
Bruner, F.	2- 9-5	2	205	
Bruner, N.	10- 9-5	3	1,085	
Cudjo	14- 9-5	1	33	
Davis, D.	11- 9-5	3	347	
Davis, J.	11- 9-5	4	1,345	
Davis, M.	11- 9-5	2	46	
Gibson	9- 9-5	8	1,445	
Hern	15- 9-5	1	1	
Ingram	1- 9-5	8	535	
Pack, S.	10- 9-5	4	113	
Peter	10- 9-5	4	47	
Sango	1- 9-5	4	1,543	
Sebalka	15- 9-5	1	267	
Sullivan, H.	11- 9-5	1	....	
Sull-Harjo	10- 9-5	2	25	
Wasutke	12- 9-5	3	642	
Burke-Greis:				
Wisner	6- 9-6	2	570	
Mays	1- 9-5	1	507	
Carter:				
Davis	13- 9-5	2	210	
James	6- 9-6	4	3,085	
Continental:				
Kays	2- 9-5	2	50	
Spencer	12- 9-5	4	665	
Empire:				
Barker	12- 9-5	1	30	
Edmondson	3- 9-5	3	115	
Empire & Amerada:				
Bullock	8- 9-5	1	452	
Gypsy:				
Bruner	10- 9-5	4	2,490	
Carter, B.	11- 9-5	8	1,757	
Earl	16- 9-5	1	....	
Hunick	5- 9-5	2	2,110	
Noble	12- 9-5	4	1,287	
Peter	10- 9-5	3	180	
Sango	1- 9-5	13	3,700	
State	16- 9-5	4	632	
Independent:				
Bruner	10- 9-5	3	422	
Sullivan	10- 9-5	1	18	
Knapp	8- 9-5	3	1,090	
Independent-Margay:				
Gains	11- 9-5	3	500	
Magnolia:				
Bryant	9- 9-5	6	218	
Cowden	4- 9-5	3	33	
Dixon	12- 9-5	1	19	
Edmondson	3- 9-5	1	4	
Gilliam	13- 9-5	1	3,669	
Holmsley	11- 9-5	7	47	
Hyde	13- 9-5	1	792	
Ingram	10- 9-5	1	15	
Lena	10- 9-5	2	16	
Moore	24- 9-5	1	90	
Seay	12- 9-5	9	1,774	
Simpson	10- 9-5	4	344	
Sparks	11- 9-5	6	791	
Sullivan	12- 9-5	3	105	
Mid-Continent:				
McCumber	9- 9-5	7	75	
Rogers	5- 9-5	1	930	
Mid-Kansas:				
Anderson	14- 9-5	2	50	
Phillips:				
Dunaway	14- 9-5	1	25	
Prairie:				
Baker	24- 9-5	1	70	
Davis	13- 9-5	3	1,845	
Graham, C.	3- 9-5	2	20	
Graham, O.	10- 9-5	4	1,095	
Stidham	11- 9-5	10	1,475	
Prairie & Whitney:				
Harjo	24- 9-5	1	116	
Roxana:				
Bayless	17- 9-5	1	115	
Hearn	13- 9-5	1	104	
Spencer	12- 9-5	2	1,314	
Shaffer:				
Clark	1- 9-5	3	145	
McCoy	36-10-5	1	280	
Sinclair:				
Foreman	18- 9-5	1	15	
Hollins	12- 9-5	1	32	
Sango	2- 9-5	4	2,130	
Skelly:				
Mays	1- 9-5	3	3,429	
Shepard	6- 9-6	3	1,677	
Spencer	12- 9-5	1	....	
Skelly & Atlantic:				
Cherry	6- 9-6	2	887	
Lottie	6- 9-6	1	1,208	
Slick:				
James	6- 9-6	2	456	
Slick et al:				
Campbell	6- 9-6	4	4,533	
Superior:				
Ingram	1- 9-5	1	449	
Walker	2- 9-5	2	1,945	
Texas:				
Anderson	2- 9-5	8	147	
Brown	10- 9-5	8	291	
James	6- 9-6	2	300	
Rogers	5- 9-5	5	1,520	
Wilmott	10- 9-5	7	391	
Tidal:				
Walker	35-10-5	3	1,819	
Watkins	9- 9-5	7	2,080	
Twin States:				
Barker	12- 9-5	3	39	
Hern	2- 9-5	4	45	
Total		294	69,104	

A. W. ROBERTSON HEADS WESTINGHOUSE COMPANY

Andrew W. Robertson, president of the Philadelphia Co., the Equitable Gas Co. and affiliated companies in Pittsburgh, Pa., has been elected chairman of the board of directors of the Westinghouse Electric & Manufacturing Co. During the time of his affiliation with the Philadelphia Co. and its subsidiaries, first as general counsel, and later as president, Mr. Robertson was especially active in the natural gas and oil industries and has a host of friends among the executives of both businesses.

Andrew W. Robertson

JOHN SULLIVAN DIES

CHATHAM, Ontario, Jan. 19.—John Sullivan, employed with the Canadian Western Natural Gas Co., at Nemiskam, Alberta, for many years, died recently, aged 57.

DOMESTIC EXPORTS OF PETROLEUM AND REFINED PRODUCTS

	Month of November		Eleven Months Ended November	
Petroleum—	1927	1928	1927	1928
Crude, bbls.	1,280,127	1,690,987	14,126,098	17,432,394
	$ 1,845,409	2,412,985	22,987,691	24,680,811
Total refined petroleum, bbls.	9,855,492	10,737,457	106,948,099	117,233,861
	$34,650,669	43,198,353	399,736,334	431,595,668
Gasoline, naphtha, and other light products, bbls	3,657,594	4,610,015	40,307,432	48,081,727
	$15,591,400	22,551,823	196,354,333	214,723,491
Oils—				
Illuminating, bbls.	1,815,380	2,087,195	18,108,731	20,623,204
	$ 6,857,608	8,954,681	74,047,419	87,897,888
Gas and fuel, bbls.	3,586,137	3,144,130	39,560,548	38,387,327
	$ 3,989,955	3,662,270	46,002,905	42,321,614
Lubricating, bbls.	785,616	883,877	8,836,643	9,982,955
	$ 8,068,464	7,886,322	$1,577,253	84,732,330
Other refined petroleum, bbls.	10,765	12,240	134,745	158,648
	$ 142,242	143,257	1,754,424	1,920,345
Paraffin wax, lbs.	32,566,432	25,164,844	309,754,077	366,048,327
	$ 1,313,184	1,299,846	13,805,918	15,473,079

SUMMARY OF STATEMENTS MADE JANUARY 10, 1929, RELATING TO BUSINESS OF VARIOUS PIPE LINES FOR MONTH ENDING DECEMBER 31, 1928

	Gross stocks	Runs from wells	Other receipts	Regular deliveries	Other deliveries
Nat. Transit	863,001.46	145,961.90	962,495.07	665,441.11	611,557.57
Southwest Pa. P. L.	429,283.61	90,632.07	1,033,177.74	472,797.78	762,579.77
Eureka P. L.	1,166,151.69	334,400.38	388,448.07	218,228.06	441,665.42
Buckeye P. L. (Mackaburg)	558,828.02	321,746.10	39,736.82	163,839.57	200,966.80
Buckeye P. L. (Lima, etc.)	2,326,759.46	102,544.02	1,657,622.70	1,389,409.84	774,722.76
Buckeye P. L. (Cleveland)	33,233.02	11,670.01	136,610.17	2,189.40	143,233.64
Indiana P. L.	503,036.50	5,869.25	2,273,783.27	1,426,008.91	891,912.32
Cumberland P. L.	504,540.79	198,838.68	160.56	215,190.79	.....
Southern P. L.	380,167.89	.....	170,763.27	39,859.78	109,721.50
New York Transit	307,858.74	26,551.67	68,413.57	189,477.21	.....
Northern P. L.	367,722.48	.....	322,031.04	173,728.49	160,976.98
Total December 31	7,440,583.66	1,238,214.08	7,053,242.28	4,856,170.94	4,097,336.76
Total November 30	8,167,896.98	1,239,563.34	6,907,623.93	4,842,715.44	4,155,013.27
Difference	727,313.32	1,349.26	145,618.35	13,455.50	57,676.51

Natural Gasoline Manufacture

R. R. OWENS NOW WITH FORREST E. GILMORE CO.

R. R. Owens, formerly in charge of the natural gasoline department of the Marland Refining Co., has become associated with the Forrest E. Gilmore Co., Tulsa, manufacturers of natural gasoline in the Mid-Continent Field.

Mr. Owens has been connected with

R. R. Owens

natural gasoline industry for several years. He was for a time connected with the Hope Engineering & Supply Co., having charge of plant construction. After leaving the Marland company last year he was engaged in mining work in Colorado.

OPERATORS' MEETING, RANGER, TEX., FEB. 26

Dr. E. R. Lederer, vice president of the Texas Pacific Coal & Oil Co. of Fort Worth, Tex., who is chairman of the plant operators' meetings of the Natural Gasoline Association of America, has appointed F. G. Yonkers to take charge of arrangements for the meeting which will be held in the American Legion Hall, Ranger, Tex., February 26. Mr. Yonkers is in charge of natural gasoline plant operations in the Ranger district for the Chestnut & Smith Corp.

A program committee consisting of Otto Peters, Hanlon Gasoline Co., and E. Buddruss, Phillips Gasoline Co., has been appointed. The program will be announced in the near future. All plant operators are invited to attend the meeting.

BUILD GASOLINE PLANT IN RICHLAND, LA., FIELD

SHREVEPORT, La., Jan. 19.—W. C. Feazel, Monroe and Richland operator; S. R. Humble, J. A. Hale and J. A. Hemler of the same areas, have organized the Richland Carbon Co. as a $250,000 concern to build a carbon and gasoline plant in the Richland Field between Alto and Archibald, La. The plant will be the first in that field. Construction will start within the next few weeks.

The carbon plant, of four units, will have a maximum capacity of 20,000,000 feet per day. Carbon recovery from Richland gas has not, so far as known here, been determined, but the gasoline recovery runs between 300 and 400 gallons per 1,000,000 cubic feet.

SEVERAL FACTORS TO CONSIDER IN BLENDING NATURAL GASOLINE

By H. G. Stevenson*

Blending gasoline may be done for the effect on gravity, vapor tension, initial boiling point, final boiling point, or it may be done for effect on all of these specifications.

A distillation curve should be made on the gasoline to be blended and a blending medium should be selected which will have the tendency to straighten the curve out, or fill in the gaps. The curve of an ideal motor fuel is almost a diagonal straight line.

There are two common methods of blending, viz.: the hot blend and the cold blend. The cold blend is the more common of the two.

In hot blending the gasoline is vaporized and the vapors are brought into contact with the blending medium, which acts as an absorbent, and takes up the vapors.

The cold blending is to mix the gasoline and the blending medium cold. It may be done in tanks or tank cars. It may be agitated by a mechanical agitator, or the gasoline may be blown into the heavier products under pressure which will mix the two. The latter method of mixing is the more common.

Effect on Gravity

The principle of effect on gravity is a simple one. Each component of a blend exerts its effect on the specific gravity of the blend in the proportion by weight in which it is present. The specific gravity is used in preference to Baume or A.P.I. gravity because it is more accurate. However, the use of Baume or A.P.I. gravities will give a general idea. In calculating the effect of blending on gravity, it should be taken into consideration that there will be some loss in the handling of the gasoline weathering loss. This weathering loss will have to be estimated also in the other specifications.

*Plant foremen's meeting, Columbian Gasoline Corp.

Effect on Vapor Tension

The same statement which applies to gravity also applies to vapor tension. The processes which employ coil blending show decreased vapor tension for the gasoline, but it is difficult to obtain a product of more than one specification which limits the sale.

Tank car or tank blending also gives a lower vapor tension for the gasoline and has the advantage of yielding a greater number of products than the coil blending processes, so that market conditions are more easily met. Wuelmers law states: "The lowering of the vapor pressure of a solvent is approximately proportional to the quantity of solute dissolved in it, if the quantity of the solute be very small."

Initial Boiling Point

Experiments show that a certain refined distillate will absorb or dissolve 4 per cent by volume of natural gas gasoline before the initial boiling point begins lowering. This fact should be considered when blending for initial boiling point.

Tests show that the commercial initial boiling point is not affected noticeably by the addition of less than 30 per cent blending medium. Tests also show that it requires 50 per cent blending medium to affect initial boiling point 10 per cent, and it takes 70 to 80 per cent blending medium to affect initial boiling point as much as 30 to 40 per cent.

Final Boiling Point

Lowering the endpoint of the low gravity liquid for the proportions in which natural gasoline is generally blended, 10 to 20 per cent above 2 degrees Fahrenheit, when the products have endpoints of 100 degrees apart and this pulling effect is increased only .2 per cent for every 10 degrees difference in endpoints. Oil absorption gasoline when blended with products having higher endpoint usually affect a greater lowering of endpoint than do other natural gasolines.

Cold Blend in Tanks

The tank is equipped with vent lines which may be left open when blowing naphtha into the tank. There is no pressure above atmospheric pressure. After the desired amount of naphtha is blown into the tank, vent lines are changed so that there will be about 10 pounds pressure held on the tank while the gasoline is being blown into the tank. The tank is equipped with a manifold with the entering line near the bottom.

This line is perforated inside the tank with one-sixteenth-inch holes to aid in mixing the blending products. There are enough of these holes spaced uniformly in two rows the full length of the pipe, which reaches the full length of the tank with the back end closed, for the total area of these small holes to equal the area of the entrance, which causes a uniform distribution of the gasoline.

Procedure

After determining the amount of naphtha to be used in the blend, pressure is released on the tank, and the desired amount of naphtha is admitted at atmospheric pressure. Then, the vent is changed so that there will be about 10 per cent pressure built up on the tank. The casinghead is then blown into the tank, the

(Continued on Page 133)

A Practical Suggestion

BOILER FEED WATER REGULATORS

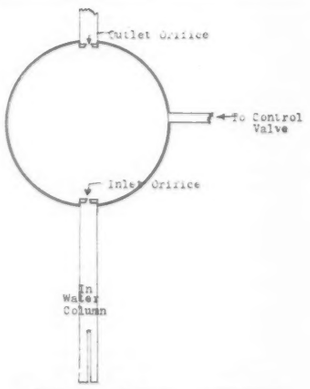
Probably no single automatic device will effect a more material saving than equipping hand-controlled boilers with feed water regulators. Water showing in the boiler gauge glass does not necessarily signify safe, efficient and economical operation. When water is carried too high, a sudden demand for more steam may cause water to swell and be carried over into the pumps, still and preheater.

When water is carried too low in gauge glass, a sudden change in load may cause the water to shrink out of sight, which not only creates an uncomfortable feeling but might cause a shut-down. A fluctuating water level causes a fuel loss which sometimes may be of consequence.

In the field there are two distinct types of regulators, one which depends on the expansion and contraction of a brass tube to actuate by a system of levers, a control valve on the feed water inlet; the other works on the drop in pressure between two orifices and will be described more in detail.

This regulator consists of a diaphram-operated control valve, installed on the feed water line, and a regulating element installed in the water column, that delivers to the control valve a pressure that gradually increases as the water level in the column increases beyond a certain predetermined level.

The pressure that is employed to operate the control valve is taken directly from the water column, and is delivered to the regulator through a small pipe that



Boiler feed water regulator.

is slotted at the end. When water is a short distance below top of slot, dry steam is delivered to the regulator and its pressure reduced because the cross-sectional area of the outlet orifice in the discharge connection is considerably greater than the area of inlet orifice.

When water raises in column it will pass through inlet orifice where it immediately evaporates, increases the pressure and thereby causes control valve to close.

Practical suggestions by those connected with the construction and operation of natural gasoline plants are invited. Payment will be made as soon as suggestions are accepted. Address all communications to the Natural Gasoline Department, The Oil and Gas Journal, Tulsa.

SECOND LAFORES PLANT

The Coltexo Corp. is building a second gasoline plant of the absorption type at Lafores, Tex. Lafores is located near Pampa in the Texas Panhandle. The plant, to be known as the No. 3 plant, will have a capacity of 20,000,000 cubic feet of gas daily. The company's No. 1 plant at Lafores has been operating for some time. The Engineering Research & Equipment Co. is in charge of construction.

The Coltexo Corp. also is building a gasoline plant in Wheeler County, Texas.

SURVEY OF LABARGE FIELD

The feasibility of building a natural gasoline plant in the LaBarge oil field located in southwestern Wyoming is under consideration. Producers in that field are financing the investigation. It is estimated that the field has a potential production of 100,000,000 cubic feet of gas daily suitable for gasoline extraction and the manufacture of carbon black.

HUMBLE'S NEW PLANT

The Humble Oil & Refining Co. will build a small absorption type gasoline plant in the Boggy Creek area of Texas. The company has considerable crude oil production in the new field and the gasoline plant will handle the gas from these wells.

TO BUILD PLANT

The Richfield Oil Co. will build a gasoline plant of the absorption type in the Santa Fe Springs Field of California. The plant will take care of the casinghead gas from its Nos. 1 and 2 wells on the Howard lease. The plant will have a capacity of 20,000 gallons daily.

Announcing
The Opening of Our Tulsa Office

EFFECTIVE January fifth, the Engineering, Research & Equipment Company opened an office in Tulsa in the Exchange National Bank Building.

This office will be in charge of Mr. P. M. Raigorodsky, Secretary-Treasurer and chief engineer of the company.

From the Tulsa office Mr. Raigorodsky will serve the Oklahoma and Kansas territory. Texas and Gulf Coast territory will continue to be served from Dallas and the West Coast from the Los Angeles office.

To Better Serve The Oklahoma and Kansas Fields

ERECO
DUPLEX

ENGINEERING, RESEARCH & EQUIPMENT CO.

Consulting, Research, Design Manufacturing, Construction.
Absorption Plant And Refinery Equipment

LOS ANGELES
655 Roosevelt Bldg.
Phone TRinity 4661

DALLAS
1313 Athletic Club Bldg.
Phone 2-6310

TULSA
907 Exchange National Bank Bldg.

35 CENTS a line first insertion; 25c a line each additional insertion. Cash in advance.

CLASSIFIED WANTS

CREATE AND BUILD BUSINESS

MAIL your advertisement now. It will be published next week. Cash with order.

FOR SALE—EQUIPMENT

PIPE

15,000 ft. Std. 3-in. Black, threaded and coupled.
15,000 ft. Std. 4-in. Black, threaded and coupled.

OIL ENGINES

1—22-H.P. Cook—vertical.
1—30-H.P. Muncie—horizontal.
2—80-H.P. Fairbanks-Morse type RE—vertical.
1—100-H.P. Fairbanks-Morse type Y—vertical.
1—85-H.P. Muncie—horizontal.

AIR COMPRESSORS

1—70-ft. No. 40 Schram direct gasoline engine driven.
1—173-ft. 8 x 9 x 8 Chicago Pneumatic steam driven.
1—310-ft. 12¼ x 12 Ingersoll Rand belt driven.
1—210-ft. Gardner portable, gasoline engine driven.
1—401-ft. Chicago Pneumatic, direct gas driven.
1—309-ft. Chicago Pneumatic, direct oil driven.
1—498-ft. Ingersoll Sergeant steam driven.
1—558-ft. Sullivan steam driven.
1—790-ft. Laidlaw-Dunn-Gordon steam driven.
1—790-ft. Laidlaw-Dunn-Gordon belt driven.
1—1,094-ft. Sullivan angle compound belt driven.
1—1,188-ft. Laidlaw-Dunn-Gordon steam driven.

FOR SALE—EQUIPMENT

TRIPLEX PUMPS

1—¾ x 4 Deane—4,000 lbs. pressure.
2—4 x 6 Deane—150 lbs. pressure.
3—5 x 8 Goulds—50 lbs. pressure.
1—5½ x 8 Smith-Vaile—150 lbs. pressure.
1—6½ x 10 Rumsey—200 lbs. pressure.
1—8 x 10 Goulds—130 lbs. pressure.
2—8¼ x 10 Goulds—130 lbs. pressure.
5—8 x 12 Goulds—50 lbs. pressure.
1—10 x 10 Deane—56 lbs. pressure.
1—12 x 14 Deming—100 lbs. pressure.
Also a quantity of steam and centrifugal pumps.

REFINERY EQUIPMENT

32—Fire stills.
6—Steam stills.
50—Condenser boxes.
50—Storage tanks—140 to 25,000 bbls.
14—Agitators.
3—Vapor towers.
9—Filter tanks.
1—20-ton Carbondale absorption refrigerating plant.
4—150-H.P. H. R. T. boilers.
2—Pipe machines.
Write for descriptive bulletin.

GAS ENGINES

1—35-H.P. Bessemer—open case.
1—35-H.P. Bessemer—enclosed case.
1—40-H.P. Bessemer—enclosed case.
1—50-H.P. Bessemer—enclosed case.
1—85-H.P. Bessemer—enclosed case.
1—135-H.P. Bessemer—enclosed case.
1—150-H.P. Bessemer—enclosed case.
2—165-H.P. Bessemer—enclosed case.
1—130-H.P. Chicago Pneumatic — enclosed case.
1—200-H.P. Chicago Pneumatic — enclosed case—NEW.

MACHINERY & SUPPLY CORP.,
Dept. 35.
Joplin, Mo.

USED LINE PIPE AND CASING FOR SALE
450′ 15½″ 70-lb. used casing.
1,000′ 12½″ 50-lb. used casing.
2,200′ 10 ″ 40-lb. used casing.
2,100′ 8¼″ 32-lb. used casing.
3,900′ 6⅝″ 24-lb. used casing.
Located in Oklahoma.
Above pipe was purchased new and used in one well.
KEYSTONE PIPE AND SUPPLY CO.
607 Holmes Bldg.
Fort Worth, Texas.

A FEW BARGAINS
35,000-bbl. Oil Storage Tank, First Class Condition, $2,750.
55,000-bbl. Oil Storage Tank. New—Immediate Shipment—Sacrifice.
7—500-gal. Unused Compartment Truck Tanks only $125.00 each.
2,000 to 20,000-gal. New and Used Storage Tanks.
Many other items you can use. Ask for bulletins.
ZELNICKER IN ST. LOUIS
Specializing in Oil Engines and Other Power Equipment, Rails, Locomotives and Cars, Steel Sheet Piling, Etc. for 30 years.

FOR SALE—Native walking beams, oak pitmans, bolsters and dividers for drilling machines made to order. Send pencil or pen sketch with dimensions to Safety Pulling Machines, Independence, Kans.

FOR SALE—One gasoline Star drilling machine, with tools, all in good condition. Can be purchased at a bargain. Address Box 25, Iowa Park, Texas.

FOR SALE OR TRADE—New 16x8x-12 Burnham Simplex Imperial pattern hot oil pump. Has been used only one week. Write Bluebonnet Oil Refining Company, Dallas, Texas.

LIQUIDATION SPECIALS
WAYNE WOOD PRODUCTS COMPANY
Collinwood, Tenn.
5—150 H.P. Boilers, H.R.T. 150-lb.
2—38-inch all copper Distilling Columns.
40—Retort Condensers.
1—Baldwin 60-ton, and 1—Porter 45-ton standard gauge Steam Locomotives.
4—20,000-gal. Steel Storage Tanks.
30-Tanks, 3,000 to 6,000 gal.
Send for complete booklet listing pumps, Motors, Stills, Tools, Air Compressors, Building Material.
CONSOLIDATED PRODUCTS CO.
17-20 Park Row, N. Y. C. Barclay 0600.

FOR SALE: 15 miles 8-inch standard 29-pound wrought iron line pipe with recessed couplings, in No. 1 condition. Was used for high pressure oil line before being taken up recently. Located in Indiana. MAX ZEIGLER AND BROS., Muncie, Ind.

NOTICE—FOR SALE—EQUIPMENT
Humble refinery—Standard Oil product cracking plant. Wilson Refining—tank, stills, pumps, agitators, boilers. Pipe and connections.
Will buy salvage plants or pipe lines.
W. BOGART
Burkburnett, Tex. Phone 136

TWO Muncie, 20 H.P. Crude Oil Engines with reverse clutches—never used—cheap for cash.
SOUTHWEST PUMP & MACHINERY CO.
2710 McGee Street, Kansas City, Mo.

FOR SALE—EQUIPMENT

FOR SALE—Two 14 x 24—150 H. P. Duplex D. A. Cooper Gas Engines direct connected to Hall Compressors, inter and after coolers, all in first-class condition. Priced right. Detailed description and price on application. CLARENDON GASOLINE COMPANY, 66 Main Street, Bradford, Penna.

FOR SALE very cheap, a diamond core drill that is in first class condition. Box C-740, The Oil and Gas Journal, Tulsa, Okla.

BARGAIN TO GAS COMPANIES AND PRODUCERS
We have in stock for immediate shipment:
20 MILES 3-inch and 3½-inch ODEE PIPE.
60 MILES 4-inch ODEE PIPE.
8 MILES 6-inch ODEE PIPE.
12 MILES 6⅝-inch ODEE PIPE.
Pipe is plain ended in 30 and 35-foot lengths.
Other sizes in line pipe and casing from 2-inch to 15½-inch.
PRODUCERS PIPE & SUPPLY CO.
Phone 2-3052; L. D. 201. 612 Kennedy Bldg.
TULSA, OKLA.

FOR SALE—Native rig bottoms and timbers sawed to order. Eclipse Saw Mill Co., General Delivery, Altoona, Kans.

FOR SALE AT A BARGAIN
One Class BB3 Ingersoll-Rand steam driven two stage air compressor having Corliss intake and Poppet discharge valves. Steam cylinder sizes 13″ and 24″ by 30″ stroke, air cylinders 13¼″ and 22″ by 30″ stroke, approximate displacement capacity 1,500 cubic feet. This machine is in first-class condition and ready for immediate shipment at a bargain price.
LANDRETH MACHINERY CO.
Joplin, Mo.

WE SPECIALIZE on all sizes of used steel axles for forging purposes—cash buyers of scrap iron in carload lots. Harry Benjamin Equipment Co., 710 Buder Bldg., St. Louis, Mo.

FOR SALE—No. 1 Buckeye Ditching Machine. A-1 condition. Completely rebuilt. Priced to sell. 328 Ritz Bldg., Tulsa, Okla.

OKELL Drilling Rigs with drill pipe and tools, Steel Derrick and Crown Block. Immediate delivery. No. 3 National Portable Drilling Rig with calf and bull wheels, only drilled one hole. E. D. Taylor, 103 W. M. Garland Bldg., Los Angeles, Calif.

VALVES AND PIPE FITTINGS
Large stock slightly used, but reconditioned and neatly painted. Guaranteed to be in perfect condition; 25% off manufacturer's wholesale price. The FIDELITY SALES COMPANY, 64 North Second Street, Kansas City, Kansas.

FOR SALE — Three strings of cable tools, with boilers, engines, bits, stems, bailers and all necessary small tools for operating the tools. Also about 60 joints of 2-inch pipe. Box 146, Cleveland, Okla.

FOR LEASE—Five 8,000-gallon insulated clean tank cars. H. A. Frame, 1539 So. Yorktown Ave., Tulsa, Okla.

FOR SALE
4,800′ 6⅝″ 20-lb. Used Casing.
2,200′ 5⅛″ 17-lb. Used Casing.
4,000′ 6¼″ 13-lb. Used Casing.
20,000′ 2″ Used Line.
10,000′ 2″ Used Tubing.
55,000′ 3″ Used Line.
20,000′ 4″ Used Line.
1 Reid 15 H.P. Gas Engine.
1 Reid 20 H.P. Gas Engine.
2 Jones Double Eccentric Powers.
1 Paova Power.
1 Single Well Pumping Outfit.
STROUSE PIPE & MACHINERY CO.
435 East North Street
Fostoria, Ohio.

ADDRESSES WANTED

THOMAS F. JACKSON. Please communicate with me. J. S. Herkness, SE cor. 10th and Lombard Sts., Philadelphia, Penna.

BUSINESS OPPORTUNITIES

CAPITAL SEEKERS—Put your project before 260 livewire brokers—cost trifling. Details free. Amster Leonard, East Orange, N. J.

Reliable parites who will furnish very highest banking house reference, own two absolutely proven locations for big natural gas wells, located right on a pipe line, which furnishes gas to over sixty cities and towns.
We offer part interest in one or both these wells, for funds to help drill same. We only require $15000.00 for each well and locations are only about 300 feet from forty million foot gas well. We guarantee good commercial production of oil or gas before you pay any money. Address Box 572, Chickasha, Okla.

WANTED
To get in touch with company desirous manufacturing on royalty basis good foolproof rotary mud bit. If interested, write Box C-751, The Oil and Gas Journal, Tulsa, Okla.

FOR SALE—Oil field machine and blacksmith shop, well equipped and well located in major West Texas oil field which has long period of development ahead; $18,000 cash required to handle. Reply to Box C-753, The Oil and Gas Journal, Tulsa, Okla.

GOING TO DRILL 640 acres close to Midwest Refining Stoney Butte structure, San Juan Basin, San Juan County, New Mexico, high gravity commercial production found at 900 ft. want 12 men who will chance ($100.00) One hundred dollars each per month for a few months, money used for drilling and expenses, all share alike. Here is an opportunity. Reply, Box 326, North Hollywood, Calif.

IDEAL LOCATION FOR A REFINERY
We are in a position to secure for responsible parties a refinery location on railway tract at a reasonable price; also, we are in a position to secure from 1,500 to 2,500 barrels of oil per day over a period. We have ample pipe line facilities for delivering the oil to the refinery site. Must be responsible parties.
BIG SPRING PIPE LINE CO.
Big Spring, Texas.

I have signed contract to start drilling operations for shallow production in New Mexico, on a well-known geologist's recommendation and geology. Am going to sell only sixteen 1/24 interest in well and eighty acres that well is located upon and 10 leases in block. Information and geological report furnished on request.
C. L. FETTY,
Operator—Oil Properties,
Box 193, Roswell, N. M.

WANTED—Persons financially able to join in geologic survey (mines and oil) of Territory of Lower California, Mexico. For details address Albert de Baer, P. O. Box 892, Hollywood, Calif.

MR. INVESTOR, ask for our FREE folder on an outstanding oil investment for 1929. Trans-American Oil Corp., 407 Perrine Bldg., Oklahoma City, Okla.

HELP WANTED

WANTED
Specialty salesman to sell belting and belt specialties, one having acquaintance in the fields preferred. Box C-742, The Oil and Gas Journal, Tulsa, Okla.

WANTED—Engineering draftsman for refinery and pipe line work, to act as squad boss; permanent job. Only applications from high-grade men will be considered. Prefer man with refinery experience both in drafting and estimating. Salary according to experience. Address Box C-765, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER SUPERINTENDENT—Construction experienced in high pressure oil refinery equipment. State age, education, salary and detailed experience. Address Box C-766, The Oil and Gas Journal, Tulsa, Okla.

WANTED HIGH CLASS executive familiar with Mid-Continent oil field equipment. Must be mechanical engineer. Box C-755, The Oil and Gas Journal, Tulsa, Okla.

35 CENTS a line first insertion; 25c a line each additional insertion. Cash in advance.

CLASSIFIED WANTS

CREATE AND BUILD BUSINESS

MAIL your advertisement now. It will be published next week. Cash with order.

HELP WANTED

WANTED—Capable production and development man; one capable of handling both rotary and cable tools, Mid-Continent Field. State age, experience and salary desired. Address Box C-761, The Oil and Gas Journal, Tulsa, Okla.

GENERAL MANAGER

WANTED to assume entire charge of company's field operations, man thoroughly experienced in Appalachian fields. Must have had responsible charge of drilling, production and operation.

Company is increasing its production from its present fee-owned proven properties.

Compensation will be very attractive for the right man.

Replies will be confidential. They must state age, experience in detail, education and training, and must give responsible references. Technical education useful but not indispensable. Box C-732, The Oil and Gas Journal, Tulsa, Okla.

BRIGHT, AMBITIOUS young man, experienced in buying and selling leases, must be capable and thoroughly understand oil business. Splendid opportunity for advancement. Salary, also commission. Address P. O. Box 3444, Tulsa, Okla.

POSITIONS WANTED

POSITION WANTED—By competent title man with 10 years experience. Married; 32 years of age; A-1 references. Wm. Self, Wagoner, Okla.

TRAFFIC MANAGER with long experience with leading Oil Well Supply Manufacturers, at liberty after March 1. Wants to locate in West or South. Willing to start at reasonable salary and let results care for future. Box C-752, The Oil and Gas Journal, Tulsa, Okla.

ENGINEER SURVEYOR, who is also a good draftsman, wishes position with Oil Company to do field and office work, keep up maps and do scouting if necessary. 12 years major companies. Address Box C-764, The Oil and Gas Journal, Tulsa, Okla.

COMPETENT OIL REFINERY ENGINEER wants permanent position in responsible charge of general refinery engineering and development work. Has held responsible position for six years with large refinery in design and installation of all kinds of refinery equipment and has done considerable research work. Reference and additional information furnished upon request. Salary, $4,000 a year. Will call if desired. Address Box C-763, The Oil and Gas Journal, Tulsa, Okla.

SUCCESSFUL MECHANICAL RUBBER GOODS SALESMAN, well known among oil trade, interested in change. Satisfactory references. Address Box C-767, The Oil and Gas Journal, Tulsa, Okla.

FIRST CLASS JOINT TURNER and all-around Oil Tool Machinist wants job; can go anywhere. Address Box C-768, The Oil and Gas Journal, Tulsa, Okla.

CALYX CORE DRILL EXPERT—15 years' experience; speaks Spanish and Portuguese. Willing to go anywhere. Tor O. Sjobom, 1611 Rose St., Berkeley, Calif.

LEASES—PRODUCTION

WE HAVE FOR SALE leases and royalties on core drilled structures in Sedgwick and Harvey Counties, Kansas.
GRESHAM & COMPANY
207 Bitting Building, Wichita, Kansas.

WILL LEASE—160 acres close to Pecos Valleys Oil Co. well, North Pecos County, Texas. Owner, 1232 W. 45th St., Oklahoma City, Okla.

LEASES—PRODUCTION

INVESTORS make money buying leases and royalties. Fisher County oil field. Several good buys. N. E. Porter, Royston, Texas.

STANDLEY FEASEL Co., Bettsville, Ohio. LEASES FOR SALE adjoining Ohio and Mich. production. Prices right.

FOR LEASE—160 acres, Reeves County, Texas. Block 6, Sec. 44, H. & G. & N. Railroad. Wm. Burger, 4761 Milentz, St. Louis, Mo.

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Located under all Section 1-12, Block 28, also Sections 5-6-7-17-18-19-20-21-22-23-24-26-29-30-31-32, Block 27.

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I OFFER 1,280 WILDCAT LOTS
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All surveyed and platted, located in the NW ¼ Section 5, Block B-5.

Half mile west Boline well in Section 4.

Half mile south Kermit—County Seat—and Flander well.

Will deliver Warranty deed to each lot. Abstractors Certificate Title.

Sell a single lot, size 50 x 140 feet, if desired.

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If you are interested in buying

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REAL ESTATE MEN AND AGENTS WANTED—Agents, salesmen and real estate men to handle lots and acreage in the townsite of Chula Vista, Hot Springs County, Arkansas, on the U. S. Highway No. 70 near Hot Springs, which is a nationally known resort in the great mineral, oil and gas district of Arkansas. Millions being spent by Arkansas Light & Power Co. for a dam which will make a lake over 20 miles long. Chance for Silver, Lead, Zinc, Oil, Gas and other minerals. Oil test to be made on townsite. Lots $25 to $100 each. Write for maps and information.
Chula Vista Townsite Co.,
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BUY DIRECT FROM OWNERS in Southwest Texas, large Drilling Block, Paid-up leases, or Ranches in fee. On excellent structures. Geological and Engineer's Reports, Abstracts, etc., furnished responsible people free. Write us what you want.
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WILL SELL interest in settled producing lease paying 30 per cent on investment; no dry holes. Many proven locations to drill. P. O. Box 183, San Antonio, Texas.

FOR SALE—Leases, Oil Production, Asphalt, Limestone and Other Mineral Lands. W. P. Harley, Bowling Green, Ky.

LEASES—PRODUCTION

I HAVE a lease on a 200 and a 160-acre tract in the Southern Kansas field which I will sell or will contract on shares. There are four producing wells on the tract at the present time. Sure locations for fifteen to twenty-five more wells. A nice gas field undeveloped. The two tracts adjoin. Address W. H. Bird, Elks Club, Junction City, Kansas.

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W. S. PATTERSON
Pecos, Texas.

LEASE—$50 per acre, SW¼ SW¼ Sec. 32-24-14, and NE¼ NE¼ Sec. 6-20-14, Tulsa County, Okla. Taylor-Rowe, Box 146, Owasso, Okla.

HAVE leases and royalties for sale or will buy in Oklahoma, McLain, Cleveland, Logan or Canadian Counties. W. R. Curry, Oil Properties, 1105 Perrine Bldg., Oklahoma City, Okla.

I AM in the market to buy Oil and Gas Leases and Acreage on good structures. W. W. Ogden, 1203 2nd Ave., Charleston, W. Va.

FOR SALE—40 acres, gas oil lease, Section 12, B-12, Winkler County, Texas. Northeast quarter. Two hundred dollars acre. John Laferski, 2253 S. Sacramento Ave., Chicago, Ill.

$3 to $5 per acre for West Texas land with Oil and Mineral right 40 acres up. New Mexico oil leases. Winter garden lots and truck farms on easy terms; agents wanted. A. Poe, 829 Wilson Bldg., Dallas, Texas.

LEA COUNTY, NEW MEXICO
Perpetual Royalties.
W. S. Patterson
Pecos, Texas.

WILL BUY New Mexico oil leases. Have for sale perpetual mineral deeds, under Major Oil Company leases, Lea County. Write MONARCH INVESTMENT COMPANY, Roswell, New Mexico.

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OIL LEASES—31 acres also 12 acres near production, price reasonable; 4,000 Acres S. E. of field on structure, $1.00 per acre—6 months to drill. Full information gladly furnished and free about Michigan field. Wm. J. Wilson, 922 Majestic Bldg., Detroit, Mich.

BROKERS — If you want some real buys in well-located TEXAS oil leases, write LEASE SCOUT, P. O. Box 200, San Antonio, Texas.

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SOUTHEAST NEW MEXICO
Leases, royalties and drilling blocks in Lea, Eddy, Chaves, Roosevelt, Curry, DeBaca and Guadalupe counties. Prompt, accurate service. F. S. Blackmar, Inc., Roswell, New Mexico.

ATTENTION, brokers and investors; Write for our list of oil leases and oil royalties in Pontotoc, Seminole and adjoining counties. Bowles and Smith, First National Bank Bldg., Ada, Okla. Phone LD35.

BREWSTER COUNTY, TEXAS
Land in fee. Warranty deed.
Will sacrifice 640 acres of land in Fee or any part thereof, for $2.50 per acre. Write Box 1601, Fort Worth, Tex.

MUSKEGON OIL FIELDS
Choice leases; also large tracts open for drilling propositions. For reasonable prices and a square deal, write E. Bacon, 17606 Turner, Detroit, Mich.

LEASES—PRODUCTION

RECENTLY ACQUIRED approximately 7,500 acres on structure, T. 6 S., R. 15 W., Osborne County, Kansas; for sale or available for drilling contract. Golden Exploration Co., 538 First National Bank Bldg., Denver, Colo.

WINKLER, PECOS, WARD, Loving and Reeves Counties. Leases and Royalties. Hemby & Anderson, Box 633, Pecos, Texas.

TEXAS
Leases and Royalties,
Drilling Blocks,
Central and Southwest Texas,
Gulf Coast.

In the play now—Bastrop, Caldwell, Guadalupe, Gonzales, Wilson Counties.
J. S. JONES,
Tel. Bldg. Phone 351.
LULING, TEXAS

DRILLING BLOCKS
10-YEAR PAID-UP LEASES

Sutton County, Texas, 6,880 acres, $1.50 per acre. Edwards County, Texas, 8,960 acres, $1.75 per acre. Schleicher County, Texas, 11,000 acres, $1.50 per acre. Favorable geological report. Offered subject confirmation. W. T. Doyle, Southwestern Life Bldg., Dallas, Texas.

FOR SALE—Lea County, New Mexico, 40-acre lease, SW¼ NW¼, Sec. 34, Twp. 18s, R. 37e; $200 per acre cash and ⅛ royalty. Also 40-acre lease, SE¼ Sec. 25, Twp. 17s, R. 36e; $100 per acre cash and ⅛ royalty. R. B. Coyle, 2215 Beechwood Blvd., Pittsburgh, Penna.

FOR SALE—5 acres in Torrance Redondo Oil Field, $1,800.00 per A., Fred Hansen, 2063 Carson St., Torrance, Calif.

CHOICE
OKLAHOMA COUNTY
LEASES AND ROYALTIES
owned by
James M. Johnson,
1109 N. Broadway, Oklahoma City, Okla.

FOR SALE—A 1,000-acre lease with 3 good producing oil wells near the center of the acreage, and 1 good gas well on the Northwest; 1 Star Drilling Machine and tools complete. Also one-half interest in a 100-acre lease with 5 wells, well equipped. Unlimited opportunities for development and more wells. This must be sold within 30 or 40 days. Excellent reasons for selling. Will stand fullest investigation. Address John Dillon, Rocky Branch, Kentucky.

Have lease off-setting shallow gas well. Will give half interest for well. Good market. Box 412, Muskogee, Okla.

ROYALTIES—PRODUCTION

WILL exchange royalties to increase my spread. Joe P. Crawford, Petroleum Bldg., Oklahoma City, Oklahoma.

40 ACRES ROYALTY under 80 acres, close to Oklahoma City Gusher. Slick, deep test drilling close. N ½ NW Sec. 32 Twp. 10N R. 1W. You can buy from one to forty acres for $100.00 per acre. 819 Petroleum Bldg., Oklahoma City, Okla.

PERPETUAL DEEDED ROYALTIES
Winkler, Loving, Ward, Lea, Pecos Counties. J. R. Haynes, Grantville, Kans.

ROYALTY under drilling block Cotton County, Okla. Royalty on pronounced structure Pecos County, Texas. Also cheap spreads in Roosevelt County, New Mexico. F. O. Harrell, 302 City National Bldg., Wichita Falls, Texas.

WILL BUY small producing royalties or undeveloped royalties on good geology. Box 544, Dallas, Texas.

LEA COUNTY, NEW MEXICO, royalty for sale. Will sell one-fourth of my royalty on 120 acres in W½ NE¼ SE¼ NE¼ Sec. 28, Twp. 25S, R. 37E. P. O. Box 1823, Tucson, Ariz.

WILL SELL 4,500 shares Royalty Corporation stock for $1.25 per share. This stock at the above price will yield 1 per cent per month. Said company has just paid its 68th consecutive monthly dividend. Address Tom Hughes, P. O. Box 458, Dallas, Texas.

ROYALTIES, Winkler County, Texas. 40-acre tracts or section spreads. Harry Haynes, Grantville, Kans.

Additional Classified Wants on Page 133

Furnace Oils in Demand at Chicago

Spot Gasoline Light; Unfavorable Weather Backing Up Orders. Many Refiners Sold Up on Furnace Oil Grades

By J. B. Waldo

CHICAGO, Jan. 21.—Orders were light in all departments on Monday although furnace oils were in better demand than gasoline. The spot gasoline demand was light and the decreased distribution due to unfavorable weather has caused some backing up on orders already placed, some distributors even asking that their contract shipments be held up until they have room to take in more gasoline. Sellers are simply sitting tight and waiting for the next development. There was no change in quotations, the major refiners holding firmly at their price of 8 cents for U. S. Motor gasoline with other sellers generally asking 7½ cents for the same grade of material. Other gasoline prices were also unchanged on Monday with a very light demand.

Kerosene is moving slowly at former prices holding its own very well. The furnace oils were called for largely but the milder weather has lessened the rush business. There is considerable complaint regarding deliveries and many leading refiners state they are sold up on all furnace oil grades. The 28-30 zero oil was being sought by several buyers for resale who stated they were not able to buy any on Monday and they had canvassed the field pretty thoroughly.

Many refiners are sold ahead on distillates and gas oil and refused any new business until they were more nearly caught up. They also declined to quote over February but some stated that their new prices would be a little higher. Heavy zero oils with low sulphur are firm with only a routine business doing. Several refiners of bright stocks here advanced their price on this material 1 cent a gallon and state that they were well sold ahead on these stocks and on steam refined cylinder stocks. Low temperatures prevailed over this territory over the week-end with milder weather with storms predicted for the middle and latter part of this week.

Bottom of Market Believed Reached

The Chicago market last week showed some feeling of greater confidence regarding the gasoline situation. The feeling was that while the consumption was greatly reduced by the bad weather and while there were free offerings of gasoline by some refiners, after all the course of the market would not be very different from last year. Prices may not reach the height that they did last summer, but many believe that the bottom of the market for reliable gasoline has been reached and that the next movement will be towards higher prices at the refineries. Much of this feeling is based on the purchases for export on an extensive scale last week. The argument is made that other buyers are bound to come into the market before the beginning of the active spring domestic demand and that as a result of this buying for export stocks of really desirable gasoline will be kept at a level where they will not be a menace to the stability of the price structure.

According to information given out in this market about 17,000,000 gallons of high-test gasoline has been purchased for shipment out of the Mid-Continent Field. Most of it is of the 64-66 375 grade. The North Texas refiners have secured the bulk of the orders owing to the advantage of the lower freights to the Gulf Coast but orders were placed with Oklahoma and Kansas refiners also. Not all of the North Texas refiners were able to comply with the specifications and get their quota of the orders but those who did have orders for about 90 days and during that time will run little if any of the U. S. Motor grade. Such business as may come to them in this grade during this period will be placed with the refiners who could not run the export qualities. So it is intimated here that the quantity of U. S. Motor gasoline out of North Texas will be limited during the next three months and refiners in other refining centers will have the opportunity of securing the business that would otherwise have been placed in North Texas and at a better price than would have been obtainable if the North Texas plants had been able to take on their usual amount of domestic gasoline business.

Much Inferior Gasoline Used

This situation will prevail as to the U. S. Motor gasoline which will pass the full specifications for that grade and it must have a sweet odor. Last summer in the height of the demand there was a great quantity of inferior motor fuel delivered to the distributors and consumed by motorists. Much of this was sour gasoline run from sour crude, but some of this, as distillation tests showed, was partly kerosene or naphthas and should not be called gasoline, although, as it would operate an automobile in warm weather, it might be classed as motor fuel.

Many of the station owners who took this in did so under protest simply because it was the best they could get at the moment. Much of it was bought because of the lower cost. The result of the performance of this fuel in the automobiles was such that there is a distinct prejudice against sour gasoline no matter what its performance in the engine may be and against inferior gasoline of any origin. Some of this sour gasoline came from West Texas but the refiners in that district have been made to bear the blame for bad gasoline run at far distant points. Only this week the writer was asked to smell two samples of gasoline without looking at the labels. This was done carefully, taking first sample A and then sample B and after a little time starting with sample B and then sample A. There was no doubt that one of the samples was sweet and the other, while not really sour, had an objectionable smell. The sweet sample bore the label of a West Texas refinery and the sour that of a central state plant which so far as known has never received any West Texas crude.

The only conclusion to be drawn from such experience is that refiners in many States run at times some gasoline that may be objectionable in some respect. One of the main reasons for dealing with a refiner with a reputation for uniformity of product is that the product can be depended upon. Even the best refiners run some gasoline occasionally that is not up to their regular quality but if they are really reliable with a reputation for their products they do not ship it to their trade but put it through a second time.

Market Must Be Found

Should the export demand develop as it is asserted that it must as the foreign distributors fill their storage for the coming season, there may be only a fair supply of the real U. S. Motor gasoline, but this does not dispose of the gasoline which will pass nearly all the tests of the exporter and all of the requirements of the domestic user. That will have to find a market and it will be an influence in the price situation without any doubt. Even the most optimistic admit that much.

Gasoline that is guaranteed by the refiner to meet the distillation tests for U. S. Motor gasoline and to pass the doctor test but not the corrosion test for all shipments was offered to resellers in this market last week as low as 6½ cents for the so-called 56 Navy; at 6⅝ cents for the 58 Navy, and 6¾ cents for the 60 Navy. The flash and the endpoint were low. The three grades were probably run with a gravity below 56 degrees and brought up to the various grades by an addition of natural gasoline. Dealers who had had some of this gasoline state that it worked fairly well in the engine and that "some of the gasoline was sweet." They said that their chief objection to the product was the fact that some of the gasoline did run sweet and some was sour.

The volume of gasoline which will be run in various parts of Texas the coming season will be much larger than last year. Many new refineries have been completed and others improved and enlarged. It is certain that the amount of better gasoline will be increased. Some of it will displace gasoline run from high-grade crude in the stations of refiners who own their own stations and it will take a considerable expansion in the consumption to take up the slack if the refineries in all sections are run at capacity. If they continue to operate on the plan of running for orders and their own distribution, there will be as strong a market as last year. Much seems to depend on the amount of spot business. Will it be as large as last year or larger?

Spot Market More Active

Right now the spot market is more active than it was last summer. There is more buying. At least there are more spot buyers and the greater part of this business is not going to the major refiners, but to the other sources of supply. The main reason, so far as can be judged, is the price. The major refiners held their price firmly and generally at 8 cents all of last week. There were no discoverable exceptions. Not one complained that the other fellows were cutting the price named. Other refiners, not all of them small at that, and resellers were selling freely a good reliable product at 7½ cents and if the buyer wanted a still lower price and was not prejudiced against gasoline from West Texas crude nor too particular as to specifications he could buy at 7 to 7¼ cents. There is misunderstanding, as previously pointed out, of the fact that a quotation based on Group 3 does not necessarily mean that the gasoline has its origin in that part of the Mid-Continent Field. Yet heads of good-sized companies insisted that they were buying good Oklahoma gasoline as low as 7 cents because the invoices stated that the price was on a Group 3 basis. There are many who know the facts and an inquiry was seen last week from a collective buying organization which specified that "no West Texas material would be considered."

There was no rush in the gasoline market last week for any grade, but a fair amount of activity. Some of the dealers are now buying the 68-70 gravity for their best grade of winter gasoline. Not being as liberally sold as the U. S. Motor or even the 60-62 gravity the orders are not regular but a seller will move several cars one day and none of the same grade for a week or more. Natural gasoline is moving here to the dealers, chiefly in one-car orders. They usually insist that what they want is the "absorption" grade. Prices have been easy and show a further decline with Grade A maintaining its margin of about 1 cent over Grade AA. It might be explained that this is commonly the margin in cold weather due to the ability of refiners of natural gasoline to run the grade in winter for reasons connected with the specifications of the various grades.

Larger Demand for Kerosene

Kerosene has been steady in price and there has been a little larger demand. Export buying has helped. There may have been some increase in the consumption during the severe cold weather but the real activity is about 60 days ahead, maybe later if the season for spring plowing is deferred by weather conditions. But there are some distributors who are preparing now for the demand and arranging for deliveries at a later date. They figure that there will be little decline and that there must be an advance when the spring business really opens.

The furnace oil demand was rushing indeed this week. It tapered off a little at the close of the week when the mild weather with rain followed the severe cold of the early part of the week. But there was a steady movement even at the close. At the very beginning of the week although subzero weather had been felt over the entire territory for a couple of days there was not the large demand that was expected. Many buyers had ordered freely the preceding week and were waiting delivery of those cars, possibly expecting that the cold would not last more than a day. But later they came into the market and their business turned it to a sellers' market.

The chief demand was in the zero gas oil group and included the 28-30 with a sufficiently low flash to be called a gas oil or even with a 225 or higher flash. This material is really scarce. Practically all of the gas oils are in that category. Distillates were also ordered freely but the consumption of gas oil has caught up with and passed the distillates as it did last season. Some sales of desirable distillates at 4 cents were made and a prediction freely offered is that distillates will be selling at above that price with the advent of the next cold snap. And even if there is no really severe cold, low temperatures seem certain for a while. It really looks like a cold winter.

Prices on all oils usable for heating are firm and slowly advancing. Refiners as a rule are asking materially higher prices for immediate business than dealers are paying on contracts made earlier in the season. Even industrial gas oil is not showing the full advance as some dealers still have oil coming to them on prices below the market. Industrial gas oil which was selling at 2⅜ cents is now strong at 2¾ cents yet some contracts are continuing at even less than that.

Fuel Oil Demand Steady

The fuel oil demand has been steady but not really active in the spot market. Large contracts provide for much of the heavy consumption and the month-to-month or order-to-order buyers are moving cautiously. There were some inquiries for the middle-of-the-month buyers, but generally they are playing a sort of waiting game, waiting for the salesman to call, apparently. Car companies report that the movement of fuel oil from West Texas is rather slow and that stocks are increasing there. This undoubtedly accounts for the low prices quoted by some refiners who need to move their oils.

The zero test oils are the only ones wanted today and many complaints have been made of the difficulty of emptying cars received that were supposedly filled with a low pour-test oil. The low-sulphur, low cold-test material is not at all freely offered, in fact refiners say that they are turning out only limited quantities. There are several large refineries which are running a mixture of Texas and Oklahoma crude and the fuel oil

(Continued on Page 142)

Unsettled Prices Prevail in the East

Tank Car Gasoline Market Shows No Change and Is "On the Fence" at 10½ Cents. Kerosene Sales Improving, but Lubs and Wax Lower

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Jan. 21.—Lower prices for tank wagon and service station gasoline in several sections of the East Coast area developed during the week. This, together with declines in lubricating oil and wax prices, has made for an unsettled market in practically all branches. Volume of business has fallen off, and the trade is showing little confidence in the market position.

Standard Oil Co. of New York, effective January 18, revised its tank wagon prices. The market in New England was cut 1 cent a gallon on tank wagon deliveries to 16 cents, the service station basis holding unchanged at 18 cents. In New York State, the market is 1 cent lower on both tank wagon and service station schedules, at 17 cents and 19 cents, respectively. The quotation for New York City, Long Island and Westchester County holds unchanged at 18 cents tank wagon and 20 cents service station. The revision by Standard of New York followed a 1-cent cut in Pennsylvania and Delaware by Atlantic Refining Co. several days ago.

As might be expected under these circumstances, buyers are showing little confidence in the market position, and are down to a hand-to-mouth buying program in most cases. On lubs and wax buyers are remaining out of the market until stocks are actually required. This trend is prevalent not only among the domestic trade, but holds true in export market circles as well.

The price war which broke out between two of the leading independent markets a fortnight ago continues, but is well localized, and the larger refining and marketing interests have not yet been drawn into the disturbance.

Weather conditions have not been favorable for motoring this week, and this has been felt in a falling off in tank wagon and service station sales. Distribution has suffered particularly in the rural communities of New England, where heavy snows have impeded traffic and cut materially into motoring.

Gasoline

The tank car market is quoted at 10½ cents per gallon at Bayonne. Jobbers are operating in routine volume only and appear to be looking for a further reduction in prices. Distribution in most instances are back to the old policy of keeping one car of gasoline on hand and another car rolling, and apparently are willing to take a chance on running short rather than being caught with a car or two on hand in a price reduction.

California U. S. Motor has weakened further, and is now available at 10½ cents a gallon here, this price representing a quarter-cent decline. Reports from the Pacific Coast this week indicate an easing off in the position of the jobbing market at this point, but thus far the best that can be done is 8 cents a gallon. California, which figures out about 9½ cents a gallon laid down at Atlantic ports north of Hatteras.

Tank Wagon Gasoline

Standard Oil Co. of New York, effective January 18, reduced its tank wagon quotation 1 cent to 16 cents throughout New England, the service station price remaining unchanged at 18 cents. In New York State, where the market had previously been 1 cent over the remainder of the territory of Standard of New York, this differential was continued, with a cut of 1 cent a gallon to 17 cents tank wagon and 19 cents service station, with the exception of New York City, Long Island, and Westchester County, where the market holds unchanged at 18 cents tank wagon and 20 cents service station. The trade in New York City had been anticipating a reduction in this territory, and as a result of the current cut, taking in the entire territory excepting New York City and contiguous markets, buying has dropped off considerably, the trade endeavoring to force a cut by slow business. In this, they are being aided by weather conditions, which are very unfavorable from the standpoint of the motorist.

Principal refiners are still centering their advertising and sales talk on their premium gasolines, which are being quoted at 2 to 3 cents per gallon above the basis ruling on the ordinary quality motor fuel.

Marketers in this area express satisfaction over the manner in which their market has been maintained in the face of the price cutting launched a short time ago by two of the leading independents operating in the New York City area. These two companies are now quoting high test gasoline at 14 cents per gallon, retail, 9 cents under the maximum price on the premium fuels of the larger operators, and 6 cents under the quotation on "white" gasoline marketed by other interests. The fact that the price war between the two independents should be isolated, and markets of other interests remain unaffected, is taken as a practical demonstration of the effectiveness of the industry's code of ethics.

Lubs

Quiet prevailed throughout the entire market this week. Volume had fallen away, and the price basis was softer, with bright stocks lower and the trade looking for declines on other grades of cylinder stocks as well. Export operators had covered their more pressing requirements during the recent market boom, and with sufficient supplies on hand to take care of their immediate needs, have been less disposed to remain in the market. Bright stocks, light, is 2 cents lower at 47 cents per gallon, with dark stock showing a similar reduction to 46 cents per gallon. Steam refined stocks are quotably unchanged this week, but buyers' ideas are 1 to 2 cents under the present quoted schedule, with some operators looking for still more drastic downward revisions.

Domestic distributors have been in the market in limited volume during the week, and while they are not carrying large stocks, this is the season of slack consumption, and it is not expected that the domestic trade will be disposed to operate in a large way at current prices.

Refiners are showing more willingness to trade, and futures can be bought at current levels for spot oil. Buyers, however, have now switched to the other side of the fence, and are "not interested" when it comes to offerings for later delivery at anywhere near present prices. With cylinder oils in the Mid-Continent firming up in sympathy with the advances recently made in eastern grades, Pennsylvania refiners are endeavoring to hold the market at the levels already attained.

Red and pale oils have been rather sluggish throughout the week, no price changes materializing. Export sales have been fair, but the domestic trade is operating only in hand-to-mouth volume.

Paraffin Wax

Refiners have been unable to maintain the market at recent levels and prices this week are an eighth to a quarter cent per pound lower. Spot stocks of 120-122 a.p.m. are one-eighth cent lower at 5½ cents a pound; 125-127 a.m.p. off one-eighth cent at 5¾ cents; 130-132 a.m.p. down one-fourth cent at 6½ cents a pound; 133-135 a.m.p. off one-eighth cent at 7¼ cents per pound; and 135-137 a.m.p. unchanged at 7¾ cents per pound, stocks of the latter melting point being small.

Export buyers have adopted a bearish tone toward the market, and both spots and futures are being neglected at the moment. With lubricating oil prices on the decline, the trade senses a probable downward reaction in paraffin wax, and naturally there is little buying of either spots or futures under these circumstances.

Paper manufacturers have been buying paraffin in fair volume during recent weeks, and considerable wax is now moving into consumption against these orders. Additional buying for this account, however, is not of large amount.

A little cheap wax is reported to have been sold out of the Gulf during the week, but this was not sufficient in amount to affect prices here, the reductions made at this point during the week being in response to lighter demand and larger offerings in this territory, as well as a sharp break in prices for scale.

Petrolatum

Steady markets continue in evidence this week. Lily white is moving out in good volume, with sellers firm at 7½ cents a pound. Snow white holds steady at 8½ cents a pound, with cream unchanged at 6½ cents. The lower grades have shown no price changes, and are moving well into export channels.

Buying of prompt shipment petrolatum by domestic manufacturers of pharmaceutical preparations continues an interesting feature of the market situation. Current movement into consumption through these channels is holding up exceptionally well for this season of the year, with no let-down in sight as yet.

Fuel Oil

The demand for Bunker "C" has been well maintained throughout the week, with refiners still quoting $1.05 per barrel at terminals, and $1.10 a barrel barged alongside within the harbor limits. There are some reports that fuel oil has been sold under this figure in a small way in eastern territory recently, but the price cutting has been sporadic, and has not affected the general market position.

Consumption on the part of the large marine interests continues the principal factor in the situation here. There has been a little picking up in this business during recent weeks, due to the fact that several large vessels have been taken from the transatlantic run and are now in service between New York and Cuba, working out of this port and fueling here more frequently.

Industrial demand for fuel oil has shown some improvement during the current week. There has been a general speeding up of operations following the year-end shut downs for inventory purpose.

This territory has undergone a severe cold snap during the week, and there has been an appreciable quickening in the demand for furnace oil. The large companies specializing in this business report that their contract deliveries have in many instances practically doubled those of the previous week.

Reports from local refiners indicate that the heavy consumption throughout the East thus far in the winter has materially strengthened the statistical position of the market, although fuel oil is still in rather large oversupply.

Gas Oil

The leading refiner continues to quote the market for 32-36 gas oil at 5¼ cents per gallon, although other large refiners are booking business on this oil at 5 cents per gallon. There has been a continued good demand for gas oil on the part of the large gas companies during the week, a number of important companies increasing withdrawals against standing contracts.

Lower grades of gas oil have been moving into consumption in a large way on furnace oil contracts. Refiners are booking business on 28 plus at 4¾ cents per gallon at refineries. Furnace oil, tank wagon delivery, is quoted at 6½ cents per gallon on large business.

Diesel Oil

The year has started off well in this branch of the market, sales to marine interests thus far in the year running ahead of those during the corresponding weeks of 1928. Refiners continue to hold the market at $2 per barrel, in bulk, at East Coast refinery terminals.

Reports in maritime circles indicate that several important completions of Diesel-powered transatlantic vessels are scheduled during the current year, with large oil tankers, to be Diesel-powered, also under construction.

Kerosene

Water white in tank car lots continues held at 9 cents per gallon, f.o.b. Bayonne refineries, although this price can be shaded by a half cent a gallon in several quarters. There has been some improvement in the jobbing call for kerosene this week, and refiners anticipate a continued active market during the rest of the first quarter of the year. A moderate export movement is reported on bulk stocks, although the cased product continues to meet with a good demand.

Tank wagon kerosene continues quoted at 15 cents per gallon in New York and New England markets. Sales in local territory have picked up during the week, while reports from New England marketing centers indicate that consumption is running close to peak totals in that area. The general wave of extreme cold weather in the New England States has greatly stimulated the consumption of kerosene in small home heating units, and this type of demand is expected to hold up well into the spring season. Kerosene distillate is moving into consumption in a large way on furnace oil contracts.

Export Markets

Gasoline inquiry for shipment abroad has slackened further, and the market is easy, although incorporation of the Export Petroleum Association has given a slightly better tone to the market. Cased Navy out of New York continues firm at 26.40 cents per gallon.

Reports from the Gulf this week indicate a quiet market. An inquiry for 6,500 tons of 64-66 375 endpoint, for shipment to France is reported, but up to the time of writing, this cargo had not been closed. Current quotations at the Gulf are: Navy, 7⅞ cents a gallon; 60-62 390 endpoint, 9⅜ cents per gallon; 64-66 375 endpoint, 9⅝ to 9¾ cents per gallon. The large companies, it is reported, are holding 64-66 375 at 10 cents.

Cased kerosene continues to move in a fair way. Standard white is held at 17.65 cents a gallon, with water white quoted at 18.90 cents. The market for bulk kerosene at the Gulf is an eighth cent lower at 6⅝ cents for prime and 7⅝ cents for water white, with indications that business could be done at 6½ cents and 7½ cents per gallon on the respective grades.

Lub oil inquiry has subsided appreciably in export quarters during the week. Export buyers sense a general break in prices, and the week's reductions on bright stocks have encouraged this feeling. It is not expected that much additional export trading on cylinder stocks will be witnessed until cylinder oil prices have yielded several cents per gallon.

A sharp break in crude scale paraffin has been accompanied by a milder reduction on refined grades this week. As a

(Continued on Page 133)

Practical Suggestions in Refining

By W. T. Ziegenhain

PHYSICAL EXAMINATION FOR OLDER EMPLOYES

The Gulf Refining Co. has required their older men to take physical examinations annually and at first found these employes resented it. In some cases, outside doctors who were employed by the company were mindful of this condition and did not choose to take the examinations seriously. This resulted in a loss both to the company and to the men themselves. The company's new system as outlined by Tom Dies, in charge of taxes, claims and insurance for the Gulf companies has eliminated this and his suggestions may find an application in other companies.

Under the present system, a regular doctor is retained and the older men are advised of their defects and a record kept of their general condition year after year. They are not examined in the spirit that if a weakness is apparent they will be discharged, but rather as part of a service to themselves and of course the company. After a defect is cited they find they are not discharged and within a short time the men see the benefit they derive from the periodical examinations.

From these records, the company is able to locate weaknesses which may be the result of the particular kind of work being done and by making a change of work an employe might be benefited without harm to another. Also, it might prove hazardous for a man not having the full use of some faculty to work on a certain job whereas if he were transferred to do some different work this weakness may not prove a handicap. Through this system the company has been able to get closer co-operation from its older employes and the safety of all of the employes has been enhanced.

Recent Patents

TREAT WITH CADMIUM HYDROXIDE

1,696,377. Process of Purifying Hydrocarbons. John C. Black, Los Angeles, and Wilson H. Low, Long Beach, Calif., assignors to Pan American Petroleum Co., Los Angeles, Calif., a corporation of California. Filed March 17, 1927. Serial No. 176,226. 11 Claims. (Cl. 196—32.)

1. The process of treating hydrocarbons, which comprises treating the same with cadmium hydroxide suspended in an aqueous solution in quantities sufficient to combine with sulphur bearing constituents to be separated, combining the same therein, and separating the treated hydrocarbons from the sulphur bearing constituents combined with the said cadmium hydroxide.

PUMP IN FINISHED DISTILLATE

1,697,573. Pressure Distillation of Hydrocarbon Oils. Francis M. Rogers and Edward J. Shaeffer, Whiting, Ind., assignors to Standard Oil Co., Chicago, Ill., a corporation of Indiana. Filed November 17, 1922. Serial No. 601,485, and in Canada May 26, 1924. 4 Claims. (Cl. 196—48.)

1. A method of distilling hydrocarbon oil for the formation of low boiling products, which consists in heating such oil under pressure to a conversion temperature, introducing into the vapors evolved by the oil, liquid hydrocarbon oil having approximately the characteristics of the desired products, removing the vapors of the desired products together with the vapors of the oil introduced and returning to the oil undergoing heating condensed products of a higher boiling point than the desired products.

RECOVERY SYSTEM SUCCESSFULLY HANDLES ALL VISCOUS LUB SLUDGE

The Empire Oil & Refining Co. is operating a sludge acid recovery system at its Ponca City, Okla., refinery which has proven entirely satisfactory during the four months it has been in use and is regularly handling the viscous lub sludge and tank bottoms. It could also easily handle cylinder stock sludge but none is being produced at present and the use of the equipment has been limited to the recovery of the other residues. The engineers realized the apparatus had to be simple to be effective and with this in mind set out to design the equipment and layout. As a result, the investment was held to less than $5,000 and there has been no replacement of any parts thus far. During that time the plant has handled 7,200 bbls. of sludge, all the refinery has made, but has not yet operated at its full capacity. Its capacity will vary with the kind of sludge processed but R. R. Mills, superintendent of the plant, is satisfied that about half of the time of operation may be turned over to recovering tank bottoms and next summer expects to handle some sludge from the pipe line crude tanks.

When the recovery system is running on viscous sludge, every care is taken to eliminate water and the system is drained of any tank bottoms as far as practical. The acid sludge from the viscous oils is granular and settles out as a tough, sticky coke. This is saturated with 66 degrees sulphuric acid which has been used in the treating of the oil. While the acid is kept in this concentrated state it exerts very little corrosive action on the iron and the exclusion of water is of principal concern at this point. The mixing tanks are kept under cover to keep out the rain. Below is a flow chart of the sludge as it is processed for use at the burners. Because of the relatively small amount being processed at present, compared to the total fuel oil needs of the plant, only the boiler house is equipped to burn it, but there would be no difficulty in making a similar arrangement to burn it under the stills. The fire is not a clean fire such as exists when burning gas or regular fuel oil, but the flow can be set to supply the burners at a constant rate and is well enough under control to be used under the stills also.

There has been no corrosive action apparent thus far on any of the boiler house equipment, including the boiler settlings and stacks. The concrete base of the stack is also free of any signs of deterioration. While the acid content of the sludge is appreciable the temperature of the burning gases and the flue gases are high enough to keep them dry and the sulphur dioxide gas is exhausted dry, eliminating any corrosive action.

To facilitate the quick and easy removal of the sludge from the agitator after treating, a straight 6-inch line leads directly from the tip of the cone to a sludge dump. At times this line gets coked up at the cone. To dislodge the mass the line is tapped with a compressed air line and by closing the main gate valve the force of the air is directed up into the agitator and within a second the flow of sludge is resumed.

Coming back to the treating of the oil itself and the elimination of water in the system, the draw-off line is tapped at other points giving it the appearance of a manifold. These lines facilitate flexibility in operation but their chief function is to permit the treatment of the oil without allowing any water to find its way into the sludge recovery system.

After the viscous oil has been treated, during which approximately 20 pounds of acid per barrel is used, the sludge cokes and falls to the bottom. It is drawn off as described before and then the treated oil is run to a neutralizing agitator. Some sludge sticks to the bottom of the agitator but the amount is not great and is washed away with water through a third line.

Sludge Storage

The sludge dump or storage is located just off to the side of the agitator the base of the dump being approximately 9 feet below the surface of the ground. The dump holds about 50 bbls. of sludge. It is made of sheet steel in the shape shown in the diagram. At first it was difficult to get a valve that would not leak, coke up or stick at the base of the dump. The valve now used was designed by the Empire engineers and has proven satisfactory. While the processing of the sludge is in progress the valve is left open sufficiently to supply a fairly constant flow of sludge to the sludge pump below. To make the valve in question, the engineers reclaimed an old 6-inch pump cylinder lining and cut out a large rectangular section, leaving just enough room at one end to permit the piston to completely seat around the inside of the lining. A threaded stem accentuates the piston from one end of the lining to the other permitting the piston to tightly seal the line at the far end and as it is adjusted forward the port in the valve is opened. An 8-inch round valve handle allows plenty leverage to be exerted to force the piston into any position. The rings on the piston may be replaced if necessary guaranteeing a tight seal and at the same time provides easy and cheap replacements.

The sludge pump is of standard design and has excess capacity for the balance of the system but this is done to provide for possible shut downs and lowers maintenance costs on the pump over a period. The pump is double acting, receiving the sludge continuously

(Continued on Page 133)

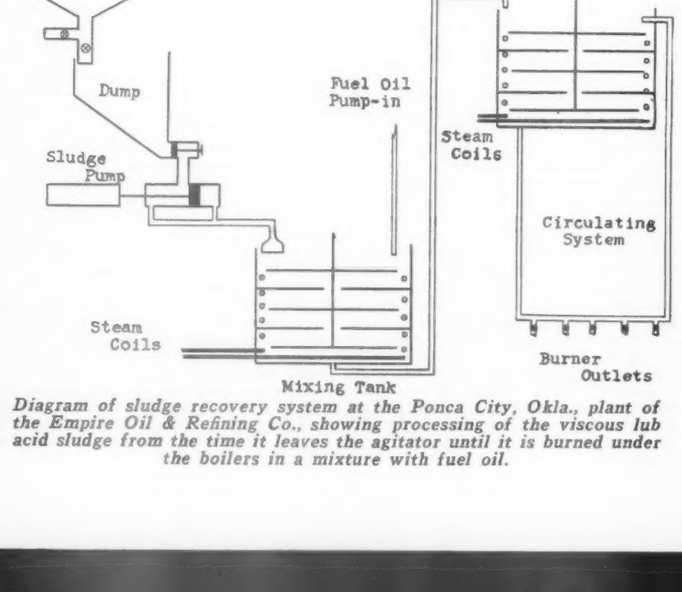

Diagram of sludge recovery system at the Ponca City, Okla., plant of the Empire Oil & Refining Co., showing processing of the viscous lub acid sludge from the time it leaves the agitator until it is burned under the boilers in a mixture with fuel oil.

USE PRESSURE STILL FOR NATURAL GASOLINE TANKS

Quite a number of pressure still chambers are being replaced at present, either because they have become obsolete or unsafe to operate at the optimum pressure and temperature for cracking. What to do with the old shells becomes a problem. They are too valuable to be junked and the Johnson Oil & Refining Co. at Cleveland, Okla., has solved its problem by converting two Dubbs chambers into natural gasoline storage tanks.

In this use, pressures of 15 to 25 pounds per square inch may be carried which the ordinary tank could not stand and the resultant savings through the lesser evaporation may be considerable.

Instead of just a storage tank, the chambers may be made to show a greater savings if used for day-to-day blending at the loading rack. If a schedule of shipments of gasoline from the refinery can be outlined in advance within reasonable limits, it is an easy matter to get the natural gasoline in on scheduled time and the blending needed of the refinery gasoline and the natural gasoline can be done in the cars at the rack with a saving in evaporation losses, lesser inventories and a closer control may be made on natural gasoline purchases depending upon the market.

By locating the pressure tanks close to the loading rack the incoming cars of natural gasoline can be unloaded into them and the tanks kept under a pressure of say 15 pounds. The evaporation losses during unloading and storing will be almost negligible. Then when the loading rack man needs to build up the gravity of the gasoline to be shipped he can blow the predetermined amount to the respective cars, securing exactly the blend desired and with a minimum of losses.

The natural gasoline may be run to the car in through the same line as that used in loading the car providing this line leads all of the way to the bottom of the car so that as the natural gasoline is forced in it will thoroughly mix and any vapors will be absorbed in the body of heavier gasoline before they finally reach the top. Blending in the cars has its disadvantages as well as its advantages but the individual operator may easily judge which best suits his case. However, considering the evaporation losses alone, the method outlined here proves most economical even though the plant is equipped with a complete vapor recovery system.

SHEEHAN COMPANY GETS PRAIRIE LINE CONTRACT

The Sheehan Pipe Line Construction Co. of Tulsa, was this week awarded the contract for ditching on the proposed Prairie Pipe Line Co. changes in line between Panova station near Shawnee, Okla., and Lockport, Ill. Under the terms of the contract the Sheehan company will ditch 463 miles of line the approximate length of line which will be built.

The contract for stringing the pipe was divided between two contracting companies, Tibbetts & Tibbetts of Kansas City, Mo., and J. L. Cox of Fort Worth, Tex.

SYSTEM HANDLES ALL VISCOUS LUB SLUDGE

(Continued from Page 132)

through a sliding valve arrangement in the pump itself. With each stroke the direct pressure of the pump is brought against the sludge as it is forced up to the ground level over to the mixing tank. The sludge is led to the tank through a 2-inch line and is pumped through a bell shaped strainer. This strainer is about 6 inches in diameter and has one-quarter-inch holes spaced around on its face to give them the same cross section as the supply line. The sludge falls in strings into the mixing tank where it loses its identity as a sludge. Here it is mixed with the ordinary 14-16 gravity plant fuel oil. The tank holds 60 bbls. when filled. When charging, about 36 bbls. of fuel oil are run in and then the sludge is pumped in as described. The blend is made to be 40 to 45 per cent sludge and 60 to 55 per cent fuel oil. The tank is provided with a stirring device in which the paddles move in a horizontal plane as shown in the diagram. A 5 horsepower motor supplies the power to the direct, gear-drive mechanism for stirring. By the time the tank is filled, the sludge is well enough dispersed throughout the mixture that it may be pumped direct to the fuel storage tanks near the boiler house. The tank is also supplied with a steam coil but this is seldom used. It was found that at the higher temperatures there was a tendency for the sludge to coagulate or re-form little solid chunks that were too heavy to be carried in suspension and either clogged the burners and lines or gave an intermittent flow through the system, making its regulation in the boiler house impossible. This is contrary to the experience of some refiners who have set an optimum temperature at which the mixing is carried out but high temperatures in the Empire system merely lead to difficulties. Some heat is supplied the sludge during the time it is forming in the agitator since the oil itself is about 100 degrees Fahrenheit when treated. By the time the sludge reaches the mixing tank, however, the temperature is considerably below that, and even during the present cold weather there has been no difficulty experienced in getting a thorough mix between the sludge and fuel oil.

The mixture enters the boiler house supply tank near the top of the tank and the supply to the boilers is drawn off at the bottom. This tank is set about 15 feet above the ground giving the oil a hydrostatic head of from 10 to 16 feet. This head is sufficient to adequately supply the boilers but the mixture cannot lie quiet or it will settle out, so a pump circulates it from the bottom of the supply tank, through the common header for the boilers and what is not consumed is pumped back into the top of the supply tank providing additional agitation. This agitation, together with the mechanical stirrer, keeps the mixture from settling out under all conditions thus far witnessed. At first a propeller arrangement was installed in the tank which gave the oil a tangential swirl but this method was not as effective as the rotating paddles.

The total amount of mixture circulated is from two to two and one-half times the amount consumed in the boiler house, a 2-inch line serving as the circulating medium. Another very important part of the system is the type of burner used and thus far, the simplest burner has proven the most satisfactory. It might be misleading to call this a burner, for it simply consists of an open one-half-inch malleable iron pipe feeding the mixture on to a fan-shaped jet of steam where the oil is atomized. The fan-shaped jet of steam is formed by smashing an one-half-inch pipe nearly flat. Care must be taken in smashing the pipe to get the opening fairly uniform to give an even distribution of the steam but this is not difficult. Pipe nipples not over 18 inches in length, or enough to reach through the boiler setting, are used on both the oil supply line and the steam jet and it is an easy matter to replace either from the outside.

UNSETTLED PRICES PREVAIL IN EAST

(Continued from Page 131)

result of this general weakness, export buyers in most instances have withdrawn from the market, pending further developments.

Gas and fuel oil movement in export channels continues confined to small lots, the market position undergoing no important modification in this respect during the week.

Petroleum Exports

The following table shows principal exports of petroleum and refined petroleum products from New York during the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Jan. 12	Jan. 5	Dec. 29
Gasoline	570,000	410,000	179,300
Naphtha	.....	.....	440,800
Kerosene	272,200	50,100	498,600
Fuel oil	.....	36,000	94,700
Lub. oil	1,246,500	353,000	2,710,200
Petroleum, refined	552,000	2,514,000	595,800
	Pounds		
Petrolatum	42,900	.....	19,600
Paraffin wax	663,800	542,000	1,039,500
Refined	24,000	.....	.....
Scale	1,104,500	43,000	244,300
Lub. grease	1,361,900	459,000	1,193,700

Imports

Imports of crude and refined oils at the principal United States ports for the week ended January 12 totaled 1,331,000 bbls., a daily average of 190,143 bbls., compared with 2,694,000 bbls., a daily average of 384,857 bbls. for the week ended January 5 and a daily average of 260,143 bbls. for the four weeks ended January 12.

(Barrels of 42 gallons)

At Atlantic Coast ports—	
Baltimore	112,000
Boston	141,000
New York	750,000
Philadelphia	201,000
Others	65,000
Total	1,269,000
Daily average	181,286
At Gulf Coast ports—	
New Orleans and Baton Rouge	62,000
Daily average	8,857
At All United States ports—	
Total	1,331,000
Daily average	190,143
Daily average four weeks	260,143

Included in the receipts of crude at New York for the week ended January 12 were the following:

To Asiatic Petroleum Co., 52,900 bbls. on the Nutra from Curacao.

To Standard Oil Co. of New Jersey, 100,000 bbls. on the Gedania from Mamomal.

To Gulf Refining Co., 65,000 bbls. on the Belridge from Las Piedras.

To Pan American Petroleum & Transport Co., 71,400 bbls. on the S. M. Spalding from Aruba, 72,400 bbls. on the William Green from Aruba, 86,600 bbls. on the R. W. Stewart from Aruba, and 64,950 bbls. on the C. A. Canfield from Aruba.

To Tide Water Oil Co., 32,000 bbls on the Saxicava from Curacao and 95,400 bbls. on the Axtell J. Byles from Las Piedras.

To Mexican Petroleum Corp., 77,000 bbls. on the Matinicock from Tampico.

California Oil Receipts

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the week ended January 12 totaled 387,000 bbls., an average of 55,286 bbls. daily, against 317,000 bbls., a daily average of 49,643 bbls. for the previous week and a daily average of 55,357 bbls. for the four weeks ended January 12.

(Barrels of 42 gallons)

At Atlantic Coast ports—	
Baltimore	153,000
New York	76,000
Philadelphia	78,000
Total	307,000
Daily average	43,857
At Gulf Coast ports—	
Total	80,000
Daily average	11,429
Atlantic and Gulf Coast ports—	
Total	387,000
Daily average	55,286
Daily average four weeks	55,357

Distribution of total California oil receipts is as follows:

Gasoline	387,000

FACTORS TO CONSIDER IN BLENDING GASOLINE

(Continued from Page 126)

amount having been calculated. A sample is taken, and the customary tests made.

Example

We have 7,000 gallons of blended gasoline to make. The desired gravity is 59. The gravity of the naphtha is 49.4. The gravity of the casinghead is 73.

Calculation

59.0 — 49.4 = 9.6.

73.0 — 59.0 = 14.0.

9.6 + 14.0 = 23.6, or the sum of the differences of the gravities of the blending materials (or it may be figured like this: 73.0 gravity of casinghead less 49.4 gravity of naphtha).

23.6 : 7,000 :: 14.0 : x.

98,000 ÷ 23.6 = 4,100 gallons naphtha.

7,000 — 4,100 = 2,890 gallons casinghead.

After these amounts of naphtha and gasoline were mixed, the gravity showed 48.8, the difference caused, very likely, by being unable to measure accurately.

Blending in Tank Cars

The general procedure of blending in tank cars is almost the same as blending in tanks, the difference being that it is necessary to have the tank cars filled to full capacity when the blending is finished which calls for accuracy in calculation and the measuring of the blending material. Another difference being in the pipe arrangement used for loading the blending products.

The desired amount of the heavier product is loaded into the car, then the line used for loading the gasoline is attached to the loading cover and extended to within 6 inches of the bottom of the car, which causes better agitation and less evaporation loss. When the car is within 6 inches of being shell full, a sample is taken and test made, then the car is finished with the product which is needed to give the required specifications. The blend in tank cars is made under 10 pounds pressure.

BROWN COUNTY PRODUCTION

Kone Production Co. has sold its production in the North Blake Field in Brown County, Texas. There were four leases and a total of over 200 acres of land and 32 producing wells with a daily average production from the property of 700 bbls. a day. The property was purchased by J. F. Martin. The understanding is it will be turned over to a company now forming. Kone Production Co.'s general office is in San Antonio.

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Brief Items for Petroleum Refiners

NO TAX ON GASOLINE FOR MILITARY SERVICE

The Supreme Court at Washington on January 21 held that the State of Texas could not collect a state tax on gasoline for gasoline used on military reservations within the state. The Grayburg Oil Co. of San Antonio was the plaintiff in the case and the Supreme Court decision upholds the contentions of the company that the tax should not be collected on sales to the Federal Government.

Texas was represented in court by Attorney General Claude Pollard and D. A. Simmons, the latter presenting oral argument. In his argument, Simmons contended that the State had made a valid distinction by imposing the tax on the occupation of the company and that the tax was not similar to that in other states where the tax has been held inoperative on purchases made by the Federal Government. He stressed the importance of the controversy to the Federal Government by asserting that it was not merely a question of whether the Government should pay 1 cent more on gasoline purchased in Texas.

ASSOCIATED COMPLETES LARGE PIPE STILL UNIT

LOS ANGELES, Calif., Jan. 19.—The Associated Oil Co. has completed the installation of a 15,000-bbl. pipe still unit at its Watson refinery. The unit is said to be one of the largest pipe stills in California. Operated as skimming plant gasoline and other products are refined without rerunning. With the new pipe still the Associated will have sufficient capacity at its Watson refinery to supply its trade in southern California.

The company also has made many improvements during the past year at its Avon (near San Francisco) refinery. Three mammoth bubble towers were installed to handle the overhead cuts from six stills. Each of these towers is 8 feet in diameter and 92 feet high. The company during the past year also has installed equipment for the manufacture of lubricating oils by the vacuum process.

INDEPENDENT INSTALLS DUBBS CRACKING UNITS

The Independent Oil Co. has purchased two 1,800-bbl. Dubbs cracking units and will install one in their Manhattan plant at Kansas City, Kans. and one in the Okmulgee, Okla. plant. These are to be completed and ready for operation by June 1 according to the plans outlined at present and when completed will operate on the fuel oil residuum produced during the skimming operation.

The fuel oil will run about 22 gravity and with this kind of charging stock the Independent expects to process about 1,800 bbls. of the raw cracking stock daily.

The Universal Oil Products Co., licensees of the Dubbs process will supervise the construction of the units.

SALT LAKE PLANT IMPROVEMENT

The Utah Oil Refining Co. is erecting a third cracking unit of the Holmes-Manley type at its refinery at Salt Lake City, Utah. The company started operating its first Holmes-Manley unit in 1928. Previous to that time the company had operated exclusively with Burton stills. Several of the Burton units are still operated. The combined capacity of the Burton and the Holmes-Manley stills totals 9,000 gallons daily, exceeding the rated crude oil capacity of 6,000 bbls. daily. The company is also making other improvements at its refinery.

GULF REFINING COMPANY BUILDS FIFTH REFINERY AT SWEETWATER

The Gulf Refining Co., one of the largest refinery organizations in the United States, has completed preliminary plans for the construction of a refinery at Sweetwater, Tex. The new refinery will have a crude oil capacity of 5,000 bbls. daily and a cracking capacity of 4,000 bbls. daily. The plant is designed to secure the maximum yields of gasoline and kerosene with a small quantity of fuel oil residuum.

The plant will be operated with West Texas crudes. The location at Sweetwater is about 200 miles west of Fort Worth on the Texas & Pacific Railroad. Large production is available in Howard, Fisher, Scurry and Mitchell Counties near Sweetwater. The Gulf Production Co. is a large producer in West Texas fields. The Gulf Pipe Line Co.'s main pipe line connecting to the Pecos County and Crane-Upton County production passes near Sweetwater connecting to the company's pipe line system to the coast. The refinery is thus assured a large crude oil supply from several fields.

The Gulf company is one of the largest distributors of refined products in Texas. The new plant will take care of the company's distributing business in the western part of the State.

The new refinery, which will be ready to operate in September, will be the fifth of the Gulf company in the United States. The company's complete plant at Port Arthur, Tex., is the largest in the United States, with a capacity of 125,000 bbls. daily. During the past three years the company has built two refineries on the East Coast, one located at Bayonne, N. J., and the other at Philadelphia, Pa. Each of these plants has a skimming capacity of 30,000 bbls. daily. A fifth plant located at Fort Worth, has a skimming capacity of 8,000 bbls. daily.

Cracking at present is confined to the Port Arthur and Fort Worth refineries. The former has a cracking capacity of 50,000 bbls. daily and the latter 5,000 bbls. daily.

ORGANIZE DISTRIBUTORS FOR COLLECTIVE BUYING

CHICAGO, Jan. 19.—A number of groups of distributors are being organized in the Standard Oil Co. of Indiana territory, the plan being to purchase gasoline collectively. One of these which is about ready to operate is made up of dealers in and around Crawfordsville, Ind. The plan of this group is to have a "paid secretary who will attend to the details of purchasing and the necessary clerical work involved.

This particular group will have a distribution of from 9,000,000 to 15,000,000 gallons of gasoline annually. The idea is akin to that of the "Dixie" organizations in Michigan and Wisconsin, but does not include for the present any cooperative advertising or showing of identity by special painting or the like. In a number of instances the jobbers who are forming these groups or who have the idea under consideration are among those who have refused to sign contracts for the coming season.

TO REOPEN REFINERY OF GALENA-SIGNAL CO.

HOUSTON, Tex., Jan. 19.—That The Texas Company will reopen the refinery of the Galena-Signal Oil Co., recently acquired by the former company, was made known by R. C. Holmes, president of the company, while in Houston the past week.

Mr. Holmes stated that, although no definite plans have been approved, the plant will be enlarged materially and engineers are now working on such plans for additions and rebuilding. The plant, which has been shut down the past year, has a rated capacity of 10,000 bbls. daily, skimming and cracking.

ENTERS EASTERN AREA

The Richfield Oil Co. of California became a direct factor in eastern markets last week when the company purchased control of the Walburn Petroleum Corp. of New York City. Controlling interest in the Walburn formerly was held by the Municipal Service Corp.

The Walburn corporation is a distributor in the New York territory. It is assumed that the company will be supplied by the California refineries of the Richfield company. The latter company is a large distributor in California and other Western States.

OHIO STANDARD ADDS TO PLANT CRACKING OUTPUT

The Standard Oil Co. of Ohio is adding a 4,500-bbl. cracking capacity at its Cleveland, Ohio, refinery. The new units are of the tube and tank type under license from the Standard Oil Co. of New Jersey. When the new units are completed the Cleveland, Ohio, refinery will have a cracking capacity of 8,500 bbls. daily.

The first cracking units of the tube and tank type were installed at the Cleveland and Ohio refineries of the Standard of Ohio last year. These units were of special desgn carrying a high operating pressure. The gasoline from the units had a high antiknock rating and the company has marketed it as a premium motor fuel in Ohio. The heavy demand for this grade gasoline necessitated the enlargement of the Cleveland refinery. Since the new units were installed the Burton cracking units at the Cleveland and Toledo refineries have been shut down. The Toledo refinery has a cracking capacity of 4,000 bbls. daily. The crude oil capacity of each of the Ohio refineries is 12,000 bbls. daily.

The Ohio Standard also is building a 1,000-bbl. cracking unit of the tube and tank type at the new refinery recently acquired from the Petroleum Refining Co. at Latonia, Ky. This plant will be operated under the name of the Latonia Refining Co. The plant which is now being enlarged will have a skimming capacity of 5,000 bbls. daily.

DENIES MERGER

There have been no negotiations between the Superior Oil Corp. and the Louisiana Oil Refining Corp. with the view of merging the two companies, according to E. R. Perry of Tulsa, chairman of the board of the former company. Reports regarding the merger have been widely circulated in oil circles during the past two weeks.

PLANT CLOSED DOWN

CHICAGO, Jan. 19.—At the office of the Atlas Petroleum Co. it was stated the plant of the Taxman Refining Co. at Wichita Falls had been closed temporarily and that all the product it had to sell was the remainder of stocks previously run.

HUMBLE ADDING CRACKING UNITS AT TWO REFINERIES

The Humble Oil & Refining Co. has cracking units with a capacity of 30,000 bbls. daily under construction at its Ingleside and McCamey, Tex., refineries. The capacity is equally divided between the two refineries which at present do not have cracking units operating. The cracking units are of the tube and tank type operated under license from the Standard Oil Co. of New Jarsey.

The McCamey refinery is located in West Texas and operates with crude oil from adjoining fields. The Ingleside refinery is located on the Gulf Coast near Corpus Christi and is connected to the Humble's West Texas pipe line system. It was built during the past year. Each of these refineries have a crude oil capacity of 15,000 bbls. daily.

With the completion of the cracking units of the Ingleside and McCamey refineries the Humble refineries will have a cracking capacity of 140,000 bbls. daily. The present cracking facilities are confined to the company's large refinery located at Baytown, Tex., where the capacity of tube and tank and Cross units totals 110,000 bbls. daily. The cracking capacity at Baytown exceeds the crude capacity of 100,000 bbls. daily.

The Humble company during the past year has operated two small topping plants at Chilton in Falls County, East Texas and Breckenridge in Stephens County, North Texas. Each of these plants have a capacity of 1,500 bbls. daily. Each consists of a pipe still adjoining the company's pipe line system. Enough gasoline is taken from the crude oil to supply the Humble's marketing requirements in that territory and the residuum is then returned to the pipe line for transportation to the coastal refineries.

These two plants with the 5,000-bbl. skimming plant at San Antonio gives the Humble company a total of six refineries in Texas with a total crude oil capacity of 137,000 bbls. daily.

START WORK ON TEXAS PLANT AT SAN ANTONIO

The Texas Company refinery at San Antonio, Tex., now under construction, has progressed to the point where four 55,000-bbl. steel storage tanks have been completed and a battery of six or more 30,000-bbl. tanks nearly completed. Excavation and foundation work is now under way on much of the rest of the plant.

The plant is on the Seguin road and between the Southern Pacific and Missouri-Kansas-Texas Railroad tracks and about 6 or 7 miles northeast of the city of an Antonio. Its crude oil supply will come from the pipe line which the company is now building from West Texas to the Houston Ship Channel, the plan being to run a spur pipe line from the main line at a point about 20 miles north of San Antonio to the refinery.

NEW YORK PRICE WAR SPEEDILY TERMINATED

NEW YORK, Jan. 21.—The price war which has raged here for the past two weeks between the Warner-Quinlan Co. and Municipal Service Corp. was terminated here today when Warner-Quinlan advanced its service station price 5 cents to 19 cents a gallon. Municipal Service has advanced 2 cents to 16 cents per gallon and is expected to again mark up its prices in conformity with the remainder of the market. None of the other large marketers here has participated in the price war. Retail gasoline prices now show a range of from 16 to 23 cents per gallon.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry. Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

IMMERSION SPECIFICATION FOR THERMOMETERS

The writer would appreciate your informing him as to why some Pennsylvania cylinder stocks are sold total immersion test and some 1-inch immersion test? Which test is best and why?—R. A. S.

The immersion point is a part of the general specifications for a thermometer. It is clear that unless the entire instrument is placed under uniform temperature conditions an accurate reading cannot be obtained because it is necessary that all of mercury, or other fluid, in the stem as well as that in the bulb of the thermometer should be under the influence of the degree of heat which it is desired to measure. There are many circumstances when it is not possible or convenient to have this desirable condition, and then it is necessary that allowance be made for that portion of the stem of the thermometer which is outside of the zone under observation. As the bulb is usually in the heated liquid, the stem portion is cooler and the quantity of the actuating fluid not heated will vary with the instrument and the conditions.

A thermometer which has been properly made will have been graduated for a specified depth, such as for flash and fire, that is corrected for this condition by comparison with a standard thermometer. The ordinary thermometers that are used for observing the temperature of the atmosphere are of the total immersion type. The thermometers that are used for the testing of petroleum products are carefully specified for the test and the instrument in which they are to be used, and if they are used under any other condition the results are liable to be in error.

While your question is not complete it appears to refer to the flash test, because we have a standard test for flash by the Cleveland open cup, described on page 66, Technical Paper 323B, Bureau of Mines, Master Specification for Lubricants and Liquid Fuels, and on page 67—"Immersion: 1 inch. The words '1-inch immersion' on Fahrenheit thermometers and a line around the stem 1 inch above the bottom of the bulb shall be etched on the thermometer." As indicated in the above a total immersion thermometer has no place in this test.

When determining viscosity by means of the Saybolt viscosimeter a thermometer graduated for total immersion is specified and the test would not be correctly made if the thermometer which had been standardized for 1-inch immersion were used.

We have known instances where a laboratory has permitted the use of a thermometer designed for another purpose but this should not be done unless there is a special emergency condition, such as the breaking of the correct instrument.

KNOCK RATING OF GASOLINE FROM VARIOUS CRUDES

A brief outline is desired of how gasoline, as obtained from different crude oils, varies in antiknock value. That is the gasoline direct from the crude without the addition of chemicals and the result of the substances that are present in the crude oil. Can you supply this information?—T. A. S.

The knock rating of different gasolines was discussed by Dr. G. Egloff at the November 20, 1928, meeting of the Independent Oil Men in Chicago. The following is from his paper:

The knocking tendency of different motor fuels varies quite widely. This variation is occasioned by differences in the type of hydrocarbons present in the gasoline. Petroleum distillates contain hydrocarbons of four series—paraffins, unsaturates, naphthenes and aromatics. These groups are present in gasoline in varying proportions, depending on the nature of the crude oil from which it is made.

Of these four classes of hydrocarbons, the poorest for high-compression motors are the paraffins, as they have the strongest tendency to produce explosive combustion. They are almost the only hydrocarbons present in straightrun gasolines from some eastern fields, and make up a large part of most gasolines obtained by simple distillation. The inferior combustion qualities of hydrocarbons of this group are apparently due to the great velocity of their chemical reaction with air. In a motor cylinder they burn so rapidly that detonation occurs. For this reason paraffin hydrocarbon gasoline is a poor motor fuel by itself, and requires the addition of cracked gasoline, benzol, or a so-called "dope" to make it useful in high-compression motors.

Unsaturated hydrocarbons burn in a high-compression motor with little tendency toward knocking. This is due to their low velocity of combustion. There are practically no unsaturated hydrocarbons present in straightrun gasoline.

The naphthene hydrocarbons also burn quietly under the oxidation conditions of a motor cylinder. They are even better antiknock agents than the unsaturates. They are present in relatively high percentages in the normal gasoline produced from the crude oils of Texas, California and Louisiana, and also occur in crudes from Mexico, Borneo, Russia and Venezuela.

The aromatic or benzol hydrocarbons are the best of the four groups in regard to antiknock properties. In an engine cylinder they burn comparatively slowly, and at any practicable compression pressure show no tendency toward detonation. Aromatic hydrocarbons are present in the gasoline produced by the normal distillation of California and Texas crudes. They are also found in gasolines from Borneo, Mexico and Venezuela.

INERT GASES TO PREVENT EXPLOSIONS

There are many explosions about gasoline plants, refineries, and natural gas plants which might be reduced in number if the machines were jacketed or insulated with chambers containing a gas which would not explode. What gases might be used for such a purpose and is there anything to the idea?—R. L. C.

The explosions which you call attention to are usually the result of the introduction of a spark or flame at the instant when there is just the required quantity of oxygen, that is in the air, mixed with the hydrocarbon gas or vapor to constitute an explosive mixture. If all of the machinery and equipment were surrounded by an atmosphere of inert gas it would not be possible for the required quantity of air to get to the hydrocarbon gas, and there would be no explosion.

The common gases which are considered to be inert are carbon dioxide and nitrogen. Carbon dioxide may be made at a low cost, but a large supply of nitrogen would be comparatively expensive.

We cannot say just how much there may be to the idea without more details as to what means would be provided for encasing the units in an inert atmosphere.

You may find some suggestions in a pamphlet published by the United States Department, The Value of Inert Gas as a Preventive of Dust Explosions in Grinding Equipment, by H. R. Brown. This may be obtained for 5 cents from the Superintendent of Documents, Washington, D. C.

The pamphlet consists largely of a description of tests made in connection with the grinding of oat hulls. The experimental plant is described in detail. The author tells of the sampling and analyzing of the gas, preliminary tests, explosibility tests and the demonstration. He answers questions as to the effect of the gas on employes and on the material ground, the quantity of flue gas required, etc., and gives specifications for the designing of an inert gas system in industrial plants. Among his conclusions is the following:

"The value of inert gas as a means of preventing dust explosions has been so well demonstrated that its use should be seriously considered wherever an explosion hazard exists which cannot be controlled through the elimination of the dust cloud or the source of ignition."

DETERMINATION OF SULPHUR IN OIL

What is considered to be the most accurate method for the determination of total sulphur in crude oil, different petroleum lubricating oils, and lubricating oils?—R. P. A.

The Carius method is considered the most accurate for the determination of sulphur. The details of this method may be found in books on analytical chemistry and especially those which treat of the analysis of organic compounds.

The United States Bureau of Mines in Circular 2,866 discussed the various methods which are used for the determination of sulphur in petroleum oils and made a comparison of the results obtained by different methods; especially the results obtained by the oxygen bomb and the Carius methods, the latter being generally accepted as the standard procedure for the determination of sulphur in organic compounds. The Carius determinations given were made in connection with a special study of this method. Only petroleum oils of the less volatile type are covered.

When used with oils containing 2.5 to 0.15 per cent of sulphur the oxygen-bomb method gives results that are consistently slightly lower than those obtained with the Carius method. This variation, for the oils used, is equivalent to 3.1 per cent, on the basis of sulphur present, for the sample containing 2.47 per cent of sulphur, and gradually increases as the percentage of sulphur in the oils decreases to 7.3 per cent for the oil containing 0.15 per cent of sulphur. With the oils studied, the presence of ammonium nitrate in the bomb does not influence the results materially. Nevertheless, for routine work, and often for research, the oxygen-bomb method for determining sulphur is entirely adequate. The use of the much more tedious Carius method is necessary only when results of the highest accuracy are essential.

COMPRESSED GAS AND ITS USE

I understand that a liquid gas is being put out which is being used from pressure tanks direct to gas stoves. Are you able to give me some information about this gas and the practicability of its use directly into city gas mains and if possible the name of the towns that are now using this system of gas supply?—F. L.

This is a liquefied gas which may be obtained as a by-product in the manufacture of gasoline from natural gas. The product, as made by several companies, is essentially propane with traces of butane, ethane and other hydrocarbon gases. There are four grades known as compressed or liquefied gas on the market, as listed below.

A product which is simply a condensate of the volatile portions obtained by fractionation from natural gas. This is the portion commonly called "wild products" in unfinished natural gasoline, and is removed by weathering when the gasoline is to be used for motor fuel.

A liquefied product containing natural hydrocarbons under 70 pounds pressure at 70 degrees Fahrenheit.

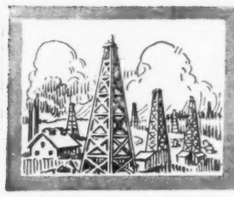
A liquefied gas under 120 to 150 pounds pressure at 70 degrees Fahrenheit. This is the product which is now being distributed in cylinders by several companies.

A liquefied natural hydrocarbon gas under high pressures, which may be of the order of several hundred pounds at normal temperatures.

These gases have high gravities, as compared with air, and the heating value is much higher than natural gas or artificial gas. These properties require special conditions for complete combustion; so elevation of the burners, much reduction in the size of the orifice, and other modifications of the ordinary gas burning appliance are necessary to obtain the high efficiencies which this form of fuel will deliver.

Natural gas has a B.t.u. value close to 1,000 per cubic foot and artificial gas near 500. Propane 2,522 and butane 3,275. The specific gravity of propane is about 1.5 and butane about 2, as compared with air.

It is reported that some butane is being used for enriching artificial gas, being introduced directly into the gas distributing system. However, the greater distribution of the liquid gas is in cylinders which are connected to the individual unit. These units use the gas for heating which is released from the cylinder and reduced in pressure by means of special valves and a suitable regulator.



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

OKLAHOMA (Group 3)—	Jan. 22		Jan. 15		Jan. 8	
50-52 450 endpoint	.07¼	.07½	.07½		.07½	.07¾
56-58 450 endpoint	.07½		.07½		.07½	.07¾
58-60 450 endpoint	.07½		.07½	.07¾	.07½	.07¾
*58-60 437 endpoint (U. S. Motor)	.0796		.08		.0802	
*60-62 437 endpoint	.0847		.0797		.0825	
*60-62 400 endpoint	.0843		.0883		.085	
*64-66 375 endpoint	.0937		.0925		.0975	
68-70 360 endpoint	.09	.09¼	.09	.09¼	.09¼	.09½
64-66 437 endpoint (blend)	.07½	.07¾	.07½	.07¾	.07½	.08

*Weighted average prices January 22, 15 and 8, as reported by representative refiners. Sales to jobbers only.

NORTH TEXAS—						
56-58 450 endpoint	.07	.07¼	.07¼		.07¼	
58-60 450 endpoint	.07¼		.07¼		.07¼	
58-60 437 endpoint (U. S. Motor)	.07¾	.07½	.07¾	.07½	.07¾	.07⅝
60-62 400 endpoint	.07¾	.08	.07¾	.08	.07¾	.08
64-66 390 endpoint	.08		.08		.08	.08¼
64-66 375 endpoint	.08¼	.08½	.08¼	.08½	.08¼	.08½
68-70 360 endpoint	.08¾	.09	.09		.09	
64-66 437 endpoint (blend)	.07¼	.07½	.07¼	.07½	.07¼	.07½
NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.07¾	.08	.08	.08¼	.08	.08¼
ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.08		.08	.08¼	.08	.08¼
PENNSYLVANIA—						
52-54 Naphtha	.09	.09¼	.09¼	.09½	.09¼	.09½
54-56 Naphtha	.09¾	.10	.09¾	.10	.09¾	.10
58-60 Gasoline	.10	.10¼	.10	.10¼	.10	.10¼
60 Gasoline	.10¼	.10½	.10½	.10¾	.10½	.10¾
62 Gasoline	.10¾	.11	.10¾	.11	.10¾	.11
64 Gasoline	.11	.11¼	.11	.11¼	.12	.12¼
CALIFORNIA—						
58-60 437 endpoint (U. S. Motor) domestic	.10	.11	.10	.11	.10	.11
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.07¼	.07½	.07½	.07¾	.07½	.07¾
56-58 450 endpoint	.07⅝	.07⅝	.07½	.07¾	.07½	.07¾
58-60 437 endpoint (U. S. Motor)	.07½	.08	.07½	.08	.07½	.08
60-62 400 endpoint	.08⅛	.08⅜	.08⅛	.08⅜	.08⅛	.08⅝
64-66 375 endpoint	.08¾	.09	.08¾	.09	.09	.09¼
68-70 360 endpoint	.09¼	.09½	.09⅜	.09⅝	.09½	.09¾
64-66 437 endpoint (blend)	.07½	.08	.07½	.08	.07¾	.08
GULF COAST (Export)—						
58-60 (U. S. Motor)	.08½					
60-62 400 endpoint	.09¼					
61-63 390 endpoint	.09¾					
64-66 375 endpoint	.10					

NATURAL GASOLINE

OKLAHOMA (Group 3)—	Jan. 22		Jan. 15		Jan. 8	
Grade A, 72-79.9, 375 e.p., rec. 90%	.07¼		.06¾		.07¼	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.06¾	.06½	.05½	.05¾	.05¾	.06
Grade B, 76-83.9, 375 e.p., rec. 85%	.05¾		.05¼	.05⅜	.05⅝	
Grade BB, 84-92, 375 e.p., rec. 85%	.05½		.05¼		.05½	.05⅝
Grade C, 80-90, 375 e.p., rec. 78%	.05½		.04⅞	.05	.05¼	.05⅜
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.07¼		.06¾		.07¼	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.06¼	.06½	.05½	.05¾	.05¾	.06
Grade B, 76-83.9, 375 e.p., rec. 85%	.05¾		.05¼		.05⅝	
Grade BB, 84-92, 375 e.p., rec. 85%	.05½	.05¾	.05¼		.05½	
Grade C, 80-90, 375 e.p., rec. 78%	.05½		.05		.05¼	
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.06¾		.05½	.05¾	.06¼	.06½
Grade BB, 84-92, 375 e.p., rec. 85%	.05¾	.06	.05¾		.06	
Grade C, 80-92, 375 e.p., rec. 78%	.05½		.05¼	.05½	.05¾	.06
CALIFORNIA—						
75-78, 375-390 endpoint	.08	.08½	.08	.08½	.07¼	.07¾
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.07	.07¼	.06½	.07	.07½	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.06¼	.06½	.05¼	.05½	.06	
Grade B, 76-83.9, 375 e.p., rec. 85%	.05¾		.05⅜		.05¾	
Grade BB, 84-92, 375 e p., rec 85%	.05½	.05¾	.05¼		.05⅝	
Grade C, 80-90, 375 e.p., rec. 78%	.05½		.05		.05½	

BURNING OIL

OKLAHOMA (Group 3)—	Jan. 22		Jan. 15		Jan. 8	
41-43 water white Kerosene	.05¼	.05½	.05¼	.05½	.05¼	.05½
42-44 water white Kerosene	.06		.05¾	.06	.05¾	.06
NORTH LOUISIANA—						
41-43 water white Kerosene	.06	.06¼	.06	.06¼	.06	.06¼
NORTH TEXAS—						
41-43 water white Kerosene	.05¾	.05½	.05¼	.05⅝	.05⅛	.05¼
40-42 water white Kerosene	.05¼	.05⅜	.05⅛	.05¼	.05	.05¼
ARKANSAS—						
41-43 water white Kerosene	.06		.06	.06¼	.06	.06¼
PENNSYLVANIA—						
43 Kerosene prime white	.07	.07⅛	.07	.07⅛	.07	.07⅛
45 Kerosene water white	.07⅛	.07¼	.07⅛	.07¼	.07⅛	.07¼
46 Kerosene water white	.07½	.07¾	.07½	.07¾	.07½	.07¾
47 Kerosene water white	.07½	.07¾	.07¾	.08	.07¾	
300 Mineral Seal	.07	.07¼	.07	.07¼	.07	.07¼
CALIFORNIA—						
38-40 water white Kero. (high-burning test)	.06½	.07	.06½	.07	.06½	.07
Engine distillate, 43-44, 445 endpoint	.07½	.08	.07½	.08	.07½	.08
Engine distillate, 42-44, 480 endpoint	.07	.07½	.07	.07½	.07	.07½
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white Kerosene	.05¼	.05½	.05¼	.05½	.05¼	.05½
42-44 water white Kerosene	.05¾	.06	.05¾	.06	.05¾	.06

FUEL OILS

OKLAHOMA (Group 3)—	Jan. 22		Jan. 15		Jan. 8	
Below 18 Fuel Oil, per bbl.	.50	.55	.50	.55	.50	.55
18-22 Fuel Oil, per bbl.	.55	.57½	.55	.57½	.55	.57½
22-26 Fuel Oil, per bbl.	.60	.62½	.60	.62½	.60	.62½
24-26 Fuel Oil, per bbl.	.62½	.65	.62½	.65	.62½	.65
26-30 Fuel Oil, per bbl.	.65	.70	.65	.70	.65	.70
28-30 Fuel Oil, per bbl. (industrial)	.80	.82½	.80	.82½	.80	.82½
28-30 Fuel Oil, per bbl. (zero cold test)	.92½	.95	.90	.92½	.90	.92½
32-36 Gas Oil (dark)	.02⅝	.02¾	.02⅝	.02¾	.02⅝	.02¾
32-36 Gas Oil (straw color)	.02¾	.03¼	.02¾	.03¼	.02¾	.02⅞
36-38 Distillate	.03⅛	.03¼	.03⅛	.03¼	.03⅛	.03¼
38-40 Straw Distillate	.03½	.03¾	.03½	.03¾	.03½	.03¾
NORTH TEXAS—						
Below 20 Fuel Oil	.55	.57½	.50	.52½	.50	.52½
24-26 Fuel Oil, per bbl.	.55	.60	.52½	.55	.52½	.55
32-36 Gas Oil (straw)	.02⅝	.02¾	.02½	.02⅝	.02½	.02⅝
38-40 Straw Distillate	.03½	.03¾	.03⅜	.03⅝	.03⅜	.03⅝
NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.75		.75		.75	
32-36 Gas Oil	.03		.03		.03	
ARKANSAS—						
33-36 Distillate	.03¼	.03½	.03¼	.03½	.03¼	.03½
32-36 Gas Oil (straw)	.03		.03		.03	
16-22 Refinery Fuel Oil, per bbl.	.75		.75		.75	
GULF COAST (South Texas)—						
Gas Oil	.04¼	.04½	.04¼	.04½	.04¼	.04½
Bunker C Fuel, per bbl.	.80	.90	.80	.90	.80	.90
PENNSYLVANIA—						
30-34 Fuel Oil	.04⅜	.04⅝	.04⅜	.04⅝	.04⅜	.04⅝
36-40 Fuel Oil	.04¾	.04⅞	.04¾	.04⅞	.04¾	.04⅞
CALIFORNIA—						
33-36 Distillate	.03¾	.04	.03¾	.04	.03¾	.04
27-32 Distillate	.03	.03½	.03	.03½	.03	.03½
*15-20 Fuel Oil, Bunker (at tide water)	.75	.85	.75	.85	.85	1.00
15-20 Fuel Oil (cargo lots), per bbl.	.70	.85	.70	.85	.75	.85
27 plus Diesel, per bbl.	.95	1.10	.95	1.10	1.15	1.19
CHICAGO DISTRICT (Based on Group 3)—						
22-26 Fuel Oil, Group 3, bbl.	.60	.65	.60	.65	.60	.65
18-22 (Group 3), per bbl.	.55	.60	.52½	.55	.52½	.55
16-20 Smackover, per bbl.	.85	.90	.80	.85	.90	
28-30 Fuel Oil (zero)	.95	1.00	.92½	1.00	.92½	1.00
32-36 Gas Oil, zero	.03	.03¼	.02⅞	.03⅛	.02⅞	.03⅛
32-36 Gas Oil (industrial)	.02¾	.02⅞	.02½		.02½	
36-38 Distillate	.03¼	.03½	.03¼	.03½	.03¼	.03½
38-40 Straw Distillate	.03½	.03¾	.03⅝	.03¾	.03⅝	.03¾

*Bunker.

LUBRICATING OIL AND WAX

OKLAHOMA (Group 3)—	Jan. 22		Jan. 15		Jan. 8	
100 vis., 2 color, 20-25 cold test	.06	.06½	.06	.06¼	.06	.06¼
100 vis., 3 color, 20-25 cold test	.05¼	.05½	.06		.06	
150 vis., 3 color, 20-25 cold test	.07¼	.07½	.08	.08¼	.08	.08¼
150 vis., 4 color, 20-25 cold test	.07	.07¼	.08		.08	
180 vis., 3 color, 23-28 cold test	.08¾	.09	.09¼	.09½	.09¼	.09½
180 vis., 4 color, 23-28 cold test	.08½	.08¾	.09	.09¼	.09	.09¼
180 vis., 5 color, 23-28 cold test	.08¼	.08½	.09	.09¼	.09	.09¼
200 vis., 3 color, 23-28 cold test	.09¼	.09½	.09¼	.09½	.09¼	.09½
200 vis., 4 color, 23-28 cold test	.09	.09¼	.09⅛	.09¼	.09⅛	.09¼
200 vis., 5 color, 23-28 cold test	.08½	.08¾	.09	.09¼	.09	.09¼
240 vis., 3 color, 25-30 cold test	.12¼	.12½	.13½	.13¾	.13½	.13¾
240 vis., 4 color, 25-30 cold test	.11¾	.12	.13	.13¼	.13	.13¼
240 vis., 5 color, 25-30 cold test	.10¾	.11	.12	.12¼	.12	.12¼
280 vis., 3 color, 25-30 cold test	.13¾	.14	.15¼	.15½	.15¼	.15½
280 vis., 4 color, 25-30 cold test	.12¾	.13	.14⅜	.15	.14⅜	.15
280 vis., 5 color, 25-30 cold test	.11¾	.12	.13¾	.14	.13¾	.14
Cylinder Stocks:						
600, steam refined, light green	.09	.12	.09	.11	.09	.11
600, steam refined, dark green	.08	.10	.08	.09	.08	.09
190-200 vis. @ 210 Bright Stock	.31	.35	.30	.33	.30	.33
150-160 vis. @ 210 Bright Stock	.28	.31	.28	.31	.28	.31
Waxes:						
124-126 White Crude Scale Wax	.04¾		.05		.05	
PENNSYLVANIA—						
34 Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
34 Sundebloom	.07¾	.08	.08¼	.08½	.08¼	.08½
36 Miners' Neutral	.07¼	.07½	.07⅛	.07½	.07⅛	.07½
150, 3 color	.21½	.22	.21½	.22	.21½	.22
180, 3 color	.25½	.26	.25½	.26	.25½	.26
200, 3 color	.28	.28½	.28½	.29	.28½	.29
220, 3 color	.30	.30½	.30½	.31	.30½	.31
600, steam refined	.22½	.23	.23½	.24	.23½	.24
635, steam refined	.27½	.28	.28½	.29	.28½	.29
650, steam refined	.29½	.30	.29½	.30	.29½	.30
600, Pennsylvania flash	.31½	.32	.31½	.32	.31½	.32
630, Pennsylvania flash	.36½	.37	.36½	.37	.36½	.37
600, E filtered	.26½	.27	.26½	.27	.26½	.27
600, D filtered	.29½	.30	.28½	.29	.28½	.29
550, E filtered	.15½	.16	.15½	.16	.15½	.16
550, D filtered	.21¼	.22	.21½	.22	.21½	.22
Pennsylvania Bright Stock	.39	.40	.39	.40	.39	.40
†122-124 White Crude Scale Wax	.05	.05¼	.05¼	.05⅜	.05¼	.05⅜
†124-126 White Crude Scale Wax	.05¼	.05⅜	.05⅜	.05½	.05⅜	.05½

*At Warren, Pa. †At New York.

GULF COAST (South Texas)—						
No. 2 color, 100 vis., pale oil	.06½	.07	.06½	.07	.06½	.07
No. 3 color, 200 vis., pale oil	.08½	.09	.08½	.09	.08½	.09
No. 3 color, 300 vis., pale oil	.11	.11½	.11	.11½	.11	.11½
No. 3½ color, 500 vis., pale oil	.12½	.13	.12½	.13	.12½	.13
No. 4 color, 750 vis., pale oil	.15	.15½	.15	.15½	.15	.15½
No. 5 to 6 color, 200 vis., red oil	.08½	.08½	.08½	.08½	.08½	.08½
No. 5 to 6 color, 300 vis., red oil	.09¼	.09½	.09¼	.09½	.09¼	.09½
No. 5 to 6 color, 500 vis., red oil	.10½	.11½	.10½	.11½	.10½	.11½
No. 5 to 6 color, 750 vis., red oil	.13¼	.14	.13¼	.14	.13¼	.14
No. 2½ color, 200 vis., pale filtered	.11¾	.12¼	.11¾	.12¼	.11¾	.12¼
No. 2½ color, 300 vis., pale filtered	.13½		.13½		.13½	
No. 2½ color, 500 vis., pale filtered	.15½	.16	.15½	.16	.15½	.16
No. 2½-3 color, 750 vis., pale filtered	.18	.20	.18	.20	.18	.20

REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

CALIFORNIA—						
130 vis., 2½-3 color	.10¼	.10½	.10¼	.10½	.10¼	.10½
200 vis., 2½-3 color	.11½	.11¾	.11½	.11¾	.11½	.11¾
300 vis., 3-3½ color	.13	.13¼	.13	.13¼	.13	.13¼
350 vis., 3½-4 color	.13½	.13¾	.13½	.13¾	.13½	.13¾
400 vis., 3½-4 color	.15	.15½	.15	.15½	.15	.15½
Red Neutral:						
200 vis., 4½-5 color	.11¼	.11½	.11¼	.11½	.11¼	.11½
300 vis., 5-6 color	.11¾	.12	.11¾	.12	.11¾	.12
400 vis., 5-6 color	.13½	.14	.13½	.14	.13½	.14
500 vis., 4½-5 color	.15¼	.15½	.15¼	.15½	.15¼	.15½
500 vis., 5-6½ color	.15	.15¼	.15	.15¼	.15	.15¼
600 vis., 6½ plus color	.15½	.15¾	.15½	.15¾	.15½	.15¾

Note: Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Jan. 22	Jan. 15	Jan. 8
Gasoline, U. S. Motor, 58-60, 437	.10¼	.10½	.10½
Kerosene, water white, 41-43	.09	.09	.09
*Fuel Oil, Bunker "C," 14-16, per bbl.	1.05	1.05	1.05
*Fuel Oil, Diesel, 28-30, per bbl.	2.00	2.00	2.00
Gas Oil, 32-36 gravity	.05¼	.05¼	.05¼
25 pale Paraffin Oil	.11¾	.11¾	.11¾
28 pale Paraffin Oil	.07½	.07½	.07½
28 red Paraffin Oil	.11½	.11½	.11½
250 red Paraffin Oil	.11	.11	.11
225 red Paraffin Oil	.09½	.09½	.09½
200 red Paraffin Oil	.09	.09	.09
Refined Wax:			
120-122 a.m.p., per lb.	.05½	.05⅝	.05⅝
125-127 a.m.p., per lb.	.05¾	.05⅞	.05⅞
130-132 a.m.p., per lb.	.06½	.06¾	.06¾
133-135 a.m.p., per lb.	.07¼	.07⅜	.07⅜
135-137 a.m.p., per lb.	.07¾	.07¾	.07¾
Petrolatum in barrels, carloads lots, per lb.:			
Dark green	.02	.02	.02
Amber	.03½	.03½	.03½
Extra amber	.03¾	.03¾	.03¾
Cream	.06½	.06½	.06½
Lily white	.07½	.07½	.07½
Snow white	.08½	.08½	.08½

*Lighterage, 5.0c a barrel extra. †Lighterage, 6.5c a barrel extra.

NEW YORK (BAYONNE) EXPORT PRICES

	Jan. 22		Jan. 15		Jan. 8	
Gasoline, U. S. Motor, 58-60 437, in cases	.2640		.2640		.2640	
Kerosene, standard white, in cases	.1765		.1765		.1765	
Kerosene, water white, in cases	.1890		.1890		.1890	
600, steam refined cylinder stocks, in bbls.	.31	.32	.31	.32	.33	.34
635, steam refined	.32	.33	.32	.33	.34	.35
650, steam refined	.37	.38	.37	.38	.37	.38
600, Pennsylvania flash	.39	.40	.39	.40	.39	.40
630, Pennsylvania flash	.43	.44	.43	.44	.43	.44
600, Warren E	.34	.35	.34	.35	.34	.35
600, Oil City E	.33		.33		.33	
Light 140-150 Bright Stocks	.47		.49	.50	.49	.50
Dark 140-150 Bright Stocks	.46		.48	.48½	.48	.48½

LOS ANGELES EXPORT PRICES

	Jan. 22		Jan. 15		Jan. 8	
Kerosene, water white	.05½	.06	.05½	.06	.05½	.06
U. S. Motor Gasoline, 53-55, 437 e.p.	.07½	.08	.07½	.08	.08	.08¼

CALIFORNIA CRUDE OIL PRICES

Standard Oil Co.-Union Oil Co. (Effective January 18, 1929)

Gravity—	Richfield, Olinda-Brea, Alamitos Hts., Signal Hill, Seal Beach, Huntington Beach, Athens, Rosecrans-Dominguez, Inglewood 1	Whittier, La Habra, Coyote Hills 2	Midway-Sunset, Elk Hills, Lost Hills, Buena Vista Hills 3	*Montebello 4	*Santa Fe Springs 5	*Coalinga 6	†Wheeler Ridge 7	*Orcutt 8	*Ventura 9	Kern River, Newhall-McKittrick 10
14 to 14.9	.70	.70	.50	.70	....	.50	.50	.85	.85	.50
15 to 15.9	.70	.70	.50	.70	....	.50	.50	.85	.85	.50
16 to 16.9	.70	.70	.50	.70	....	.50	.50	.85	.85	.50
17 to 17.9	.70	.70	.50	.70	....	.50	.50	.85	.85	.50
18 to 18.9	.75	.75	.56	.70	....	.56	.56	.85	.85	.50
19 to 19.9	.80	.80	.62	.75	....	.62	.62	.85	.85	.50
20 to 20.9	.85	.84	.68	.80	....	.68	.68	.85	.85	....
21 to 21.9	.89	.88	.74	.85	.89	.74	.74	.86	.86	....
22 to 22.9	.93	.91	.80	.90	.92	.80	.80	.87	.87	....
23 to 23.9	.97	.94	.85	.95	.95	.85	.85	.90	.90	....
24 to 24.9	1.01	.97	.90	.98	.98	.88	.88	.93	.94	....
25 to 25.9	1.05	1.00	.95	1.01	1.01	.91	.91	.95	.98	....
26 to 26.9	1.09	1.04	1.00	1.04	1.04	.94	.94	.97	1.02	....
27 to 27.9	1.13	1.08	1.05	1.07	1.07	.98	.97	....	1.06	....
28 to 28.9	1.17	1.12	1.10	1.10	1.10	1.02	....	....	1.10	....
29 to 29.9	1.21	1.16	1.16	1.12	1.16	1.06	....	....	1.14	....
30 to 30.9	1.25	1.20	1.22	1.16	1.20	1.10	....	....	1.18	....
31 to 31.9	1.30	....	1.28	....	1.25	1.14	....	....	1.23	....
32 to 32.9	1.35	....	1.34	....	1.30	1.18	....	....	1.28	....
33 to 33.9	1.41	....	1.40	....	1.35	1.22	....	....	....	....
34 to 34.9	1.47	....	1.46	....	1.40	1.26	....	....	....	....
35 to 35.9	1.53	....	....	....	1.45	1.30	....	....	....	....
36 to 36.9	1.59	....	....	....	1.50	....	....	....	....	....
37 to 37.9	1.65	....	....	....	1.55	....	....	....	....	....
38 to 38.9	1.71	....	....	....	1.60	....	....	....	....	....
39 to 39.9	1.77	....	....	....	1.65	....	....	....	....	....
40 to 40.9	1.83	....	....	....	....	....	....	....	....	....
41 to 41.9	1.89	....	....	....	....	....	....	....	....	....
42 to 42.9	1.95	....	....	....	....	....	....	....	....	....

*Column 1—Signal Hill, Seal Beach, Huntington Beach and Alamitos Heights crude, 14 to 21.9 gravity, inclusive; Richfield, Olinda-Brea and Fullerton, 14 to 30.9 gravity; Torrance and Inglewood, 14 to 28.9 gravity. Dominguez and Athens-Rosecrans, 24 to 42.9 gravity.
Column 2—Whittier crude, 14 to 22.9 gravity; Coyote Hills, 14 to 30.9 gravity.
Column 3—Kern River, Newhall and McKittrick, 14 to 19.9 gravity; Midway-Sunset, Buena Vista and Elk Hills, 14 to 33.9 gravity; Lost Hills, 14 to 34.9 gravity.
Columns 8 and 9 posted by Union Oil Co. only.

†On October 2, 1928, Standard Oil Co. of California discontinued contracting for purchase of Kern River crude and on October 29 established following prices on grades below 14 gravity: 11 to 11.9 degrees at 45 cents, 12 to 19 degrees at 50 cents.

On December 1, 1928, the Union Oil Co. adopted the above schedule of the Standard on Kern River crude and in addition posted Midway-Sunset, Elk Hills, Buena Vista, Lost Hills and Coalinga crude as follows: 11-11.9 gravity, 45 cents; 12 to 12.9 gravity, 55 cents; and 13 to 13.9 gravity at 65 cents. All grades of Elwood crude were cut 7 cents.

CRUDE OIL GRAVITY TABLE

Gravity—	Okla., Kans., N. C. Tex. 1	No. La. and Arkansas 2	Smackover, Ark. 3	Stephens, Ark. 4	Gray County (Texas Panhandle) 5	Salt Creek, Wyo. 6	Grade B & Light Crude (G. Coast) 7	Somerset (South Central Texas) 8
24 and above	....	....	.90	....	....	....	....	....
Below 24	....	....	.75	....	....	....	....	....
Below 25	.60	..	....	....	....	....	1.15	....
25 to 25.9	.67	..	....	....	....	....	1.17	....
Below 26	....	....	....	....	....	....	....	....
26 to 26.9	.74	....	....	....	....	....	1.19	....
27 to 27.9	.81	....	....	....	....	....	1.21	....
Below 28	....	.61	....	.76	.68	....	....	....
28 to 28.9	.88	.88	..	.77	.68	....	1.23	....
29 to 29.9	.95	.95	..	.79	.75	.95	1.25	....
30 to 30.9	1.02	1.02	..	.81	.82	1.02	1.27	....
31 to 31.9	1.09	1.09	..	.83	.89	1.09	1.29	....
32 to 32.9	1.16	1.16	..	.85	.96	1.16	1.31	1.05
33 to 33.9	1.21	1.21	..	....	1.01	1.21	1.33	1.07
34 to 34.9	1.26	1.26	..	....	1.06	1.26	1.35	1.09
35 to 35.9	1.31	1.31	..	....	1.11	1.31	1.37	1.11
36 to 36.9	1.36	1.36	....	....	1.16	1.36	....	1.13
37 to 37.9	1.41	1.41	....	....	1.21	1.41	....	1.15
38 to 38.9	1.46	1.46	....	....	1.26	....	....	1.17
39 to 39.9	1.51	1.51	....	....	1.31	....	....	....
40 to 40.9	1.56	1.56	..	....	1.36	....	....	....
41 to 41.9	1.61	1.61	..	....	1.41	....	....	....
42 to 42.9	1.66	1.66	..	....	1.46	....	....	....
43 to 43.9	1.71	1.71	....	....	1.51	....	....	....
44 and above	1.76	1.76	....	....	1.56	....	....	....

Column 1—Magnolia Petroleum Co. posted schedule August 2, 1928, making price below 25 gravity 60 cents per barrel, 25-25.9 gravity 67 cents, 26-26.9 gravity 74 cents, and 27-29.9 gravity 75 cents, 30.30.9, 90 cents, and 31-31.9, $1.05, with balance of the price schedule as shown.

Oklahoma—Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Gypsy Oil Co., Carter Oil Co., The Texas Company, July 26.

North Central Texas—Including Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs (Southwest Texas, Iatan and Panola) (Iatan posted at flat price of 93 cents by Magnolia on January 14, 1928), Currie, Nocona and Moran. Prairie, Sinclair and Gulf, The Texas Company, Humble Oil & Refining Co., July 26.

Kansas—Prairie, Sinclair, Carter, The Texas Company, July 26.

Column 2—Arkansas and North Louisiana—[Caddo, Bull Bayou, Crichton, DeSoto, Haynesville, Homer, and El Dorado only], Standard Oil Co. of Louisiana, Louisiana Oil Refining Corp., and Gulf Refining Co., August 2. Magnolia Petroleum Co. schedule effective August 7 applies to Pine Island, Haynesville, Bull Bayou, Louisiana, and El Dorado, Ark., light crude. The Texas Company August 8 posted prices below 28 gravity at 7 cents differential per degree with minimum of 60 cents for all below 25 gravity.

Column 3—February 6, Louisiana Oil Refining Corp.; February 7, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co., and on February 10, Atlantic Oil Producing Co.

Column 4—Atlantic Oil Producing Co., Louisiana Oil Refining Corp., August 8.

Column 5—Humble Oil & Refining Co., July 26.

Column 6—Midwest Refining Co., July 26. All crude over 37 gravity $1.41 per barrel.

Column 7—Humble Oil & Refining Co. and other major buyers (schedule ends 35 and above). March 14, with exception of Magnolia Petroleum Co., which stops at 31 degrees gravity. Sun Pipe Line Co. and The Texas Company posted 2 cents differential for each degree above 35 gravity and $1.47 for 40 gravity and above.

Column 8—Grayburg Pipe Line Co. and Pioneer Oil & Refining Co., April 7.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

Corsicana heavy (January 11)	.80
Other fields	See gravity table

*Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE
Carson and Hutchinson

Below 32 gravity	$ .69
32-32.9	.76
33-33.9	.81
34-34.9	.86
35-35.9	.91
36-36.9	.96
37-37.9	1.01
38-38.9	1.06
39-39.9	1.11
40-40.9	1.16
41-41.9	1.21
42-42.9	1.26
43-43.9	1.31
44 and above	1.36

Wheeler County

Below 30 gravity	$ .65
30-30.9	.72
31-31.9	.79
32-32.9	.86
33-33.9	.91
34-34.9	.96
35-35.9	1.01
36-36.9	.106
37-37.9	1.11
38-38.9	1.16
39-39.9	1.21
40-40.9	1.26
41-41.9	1.31
42-42.9	1.36
43-43.9	1.41
44 and above	1.46
Gray County	See gravity table

Humble Oil & Refining Co., and Magnolia Petroleum Co., July 26.

WEST TEXAS

Iatan*	Same as North Texas
Crane-Upton-Crockett, Pecos, Winkler and Glasscock (July 26)‡	$ .65
Chalk†	.80

*Includes Howard County and Westbrook Fields. Marland Refining Co. pays $1.05 for Howard County crude, effective May 21.
†Magnolia Petroleum Co., January 14, 1928.
‡Posted by Humble Oil & Refining Co., Magnolia Petroleum Co., and Gulf Pipe Line Co.

ARKANSAS-NORTH LOUISIANA

Cotton Valley (Below 36 gravity April 11)	$ .75
Bellevue (Feb. 27, 1927)	1.25
Urania (Oct. 16, 1928)	.90
East El Dorado (March 16, 1927)	1.00
Other fields	See gravity table

*Cotton Valley crude above 36 gravity takes same gravity price schedule as shown for North Louisiana and Arkansas crude in Mid-Continent gravity price table.
Note—Cotton Valley and Bellevue posted by Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Gulf Refining Co., and Magnolia Petroleum Co.; (Magnolia Petroleum Co. posted Cotton Valley February 8); Urania posted by Louisiana Oil Refining Corp.; East El Dorado, Magnolia Petroleum Co., Gulf Refining Co.

GULF COAST
(Goose Creek, Hull, Liberty, West Columbia, Orange Boling, Sour Lake, Humble, Sugarland, Raccoon Bend, High Island, Pierce Junction and Spindletop.)

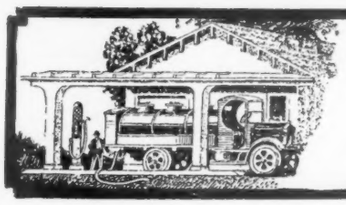
Grade A (March 14)*	$1.20
Grade B	See gravity table
Jennings, La. (March 14)†	$1.05
Saratoga, Batson, Daytona, (March 14, 1927)‡	1.20
Markham (March 14)‖	1.00
High Island (December 14)¶	1.00

*Humble Oil & Refining Co. and other major buyers. †Gulf Pipe Line Co. ‡Sun Pipe Line Co. ‖The Texas Company.
¶Posted by Gulf Pipe Line Co.

ROCKY MOUNTAIN STATES
Ohio Oil Co.-Midwest Refining Co.
(Effective July 27, 1928)

Rock Creek, Wyo.	$1.33
Salt Creek	See gravity table
Big Muddy	1.33
Grass Creek, heavy	.90
Grass Creek, light	1.42
Mule Creek (May 1)	1.10
Elk Basin	1.48
Lance Creek	1.48
Poison Spider (March 14, 1927)	1.00
Notches (March 14, 1927)	.65
Rex Lake (February 22)	1.10
Osage	1.48
Lost Soldier (contract)	.95
Hamilton Dome (March 14 1927)	.85

(Continued on Page 138)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Jan. 22.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Chicago dist.	15.0	16.0	...	12.0
Decatur, Ill.	15.2	15.0	...	12.1
E. St. Louis	14.4	16.4	...	11.2
Joliet	15.4	17.4	...	12.3
Peoria	15.2	14.0	...	12.1
Quincy	15.2	17.2	...	11.9
Davenport, Ia.	18.5	20.5	3.0	12.3
Des Moines	18.5	18.5	3.0	12.3
Keokuk	18.5	20.5	3.0	12.3
Sioux City	18.1	20.1	3.0	11.9
Duluth, Minn.	18.5	20.5	2.0	12.9
Mankota	18.1	20.1	2.0	12.7
Minneapolis	18.2	20.2	2.0	12.9
La. Crosse, Wis.	18.2	20.2	2.0	13.0
Milwaukee	17.1	19.1	2.0	11.9
Madison	17.3	19.3	2.0	12.1
Detroit, Mich.	18.8	20.8	3.0	13.7
Grand Rapids	18.7	20.7	3.0	13.6
Saginaw	18.9	20.9	3.0	13.8
Evansville, Ind.	18.0	20.0	3.0	13.0
Fort Wayne	18.4	18.4	3.0	13.4
Indianapolis	18.2	18.2	3.0	13.2
South Bend	18.4	20.4	3.0	13.4
Fargo, N. D.	19.9	19.9	2.0	14.9
Huron, S. D.	20.3	22.3	4.0	13.7
Sioux Falls	19.1	21.1	4.0	13.4
K. C., Mo.*	17.9	17.9	3.0	10.6
Springfield*	17.8	19.8	3.0	11.5
St. Louis*	16.9	16.9	2.5	11.3
St. Joseph*	17.5	17.5	3.0	11.2
Wichita, Kans.	15.8	17.8	2.0	10.8
Bartlesville, Ok.	16.5	18.5	3.0	10.5

*State tax 2 cents; remainder city tax.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	14 7	11 9
V. M. & P. naphtha	16 2	12 9
Cleaner's naphtha	18 0	13 9
Stanisol	19.0	14 9

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting. Effective January 5.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9 0
100 to 799 gallons	8 0
800 or more gallons	7.5

Note—Outside Chicago furnace oil discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

The following quantity discounts from the service station price are allowed on monthly sales of gasoline: 2,000 gallons or less, 2 cents; more than 2,000 and less than 6,000 gallons, 2½ cents; more than 6,000 gallons, 3 cents. Discounts are allowed each month, and they are not cumulative. Delivery tickets showing date and quantity delivered must be sent to the seller before the tenth of the month to secure the discount on the previous month's purchases.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlanta, Ga.	22.0	24.0	4.0	16.5
Augusta	22.0	24.0	4.0	15.5
Macon	22.0	22.0	4.0	16.5
Savannah	21.0	23.0	4.0	14.5
Birm'ham, Ala.	20.0	22.0	4.0	13.0
Mobile	22.0	24.0	4.0	15.0
Montgomery	23.0	25.0	4.0	16.5
Clarks'le, Miss.	22.0	24.0	5.0	13.0
Jackson	19.0	21.0	5.0	14.5
Natchez	20.0	22.0	5.0	14.0
Gulfport	23.5	25.5	5.0	14.0
Vicksburg	21.5	23.5	5.0	14.0
Jack'ville, Fla.	23.0	25.0	5.0	13.5
Miami	24.0	26.0	5.0	15.5
Pensacola	24.0	26.0	5.0	13.5
Tampa	23.0	25.0	5.0	13.5
Lexington, Ky.	21.0	22.0	5.0	15.5
Covington	21.0	22.0	5.0	15.5
Louisville	21.0	23.0	5.0	15.0
Ashland	22.0	24.0	5.0	15.5
Catlettsburg	22.0	24.0	5.0	15.5

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. Pensacola and Mobile taxes include 1-cent city levy. Gulf port tax includes privilege tax of 2 cents in addition to state tax.

PACIFIC COAST TERRITORY

Standard Oil Co. (California)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
San Francisco	17.0	21.0	3.0	15.5
Los Angeles	16.5	20.5	3.0	15.5
Reno, Nev.	22.0	26.0	4.0	19.0
Portland, Ore.	17.5	21.5	3.0	16.5
Seattle, Wash.	16.5	20.5	3.0	16.5
Tacoma	16.5	20.5	3.0	16.5
Spokane	20.5	24.5	3.0	20.5
Phoenix, Ariz.	18.0	22.0	4.0	20.5

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Dallas, Tex.	16.0	20.0	2.0	12.0
Fort Worth	13.0	16.0	2.0	12.0
Houston	16.0	20.0	2.0	13.0
San Antonio	13.0	17.0	2.0	16.0
El Paso	17.0	20.0	2.0	16.0
Texarkana	16.5	20.5	2.0	13.0
Muskogee, Ok.*	16.0	18.0	3.0	12.0
Okla. City*	16.0	18.0	3.0	12.0
Tulsa*	17.0	19.0	3.0	10.0
Ft. Smith, Ark.	16.0	19.0	5.0	13.0
Little Rock	19.0	22.0	5.0	13.0

*Gasoline tank wagon price to dealers 2 cents under posted tank wagon.

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Omaha	17.25	19.25	2.0	12.25
McCook	18.75	20.75	2.0	13.75
Norfolk	17.75	19.75	2.0	12.75
N. Platte	18.75	20.50	2.0	13.50
Scotsbluff	18.75	20.75	2.0	13.25

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Denver, Colo.	16.0	19.0	3.0	14.5
Pueblo	17.0	20.0	3.0	14.5
Grand Junction	22.5	25.5	3.0	18.0
Casper, Wyo.	19.0	22.0	3.0	13.0
Cheyenne	20.0	23.0	3.0	14.5
Butte, Mont.	23.5	26.5	3.0	19.0
Helena	23.5	26.5	3.0	19.0
Salt Lake, Utah	22.0	25.0	3.5	17.0
Albu'que, N. M.	22.0	25.0	5.0	17.0
Boise, Idaho	24.5	27.5	4.0	19.0
Twin Falls	24.5	27.5	4.0	19.0

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlantic City	16.0	20.0	2.0	13.0
Newark, N. J.	16.0	20.0	2.0	13.0
Annapolis, Md.	18.0	22.0	4.0	13.0
Baltimore	18.0	22.0	4.0	13.0
Cumberland	18.0	22.0	4.0	13.0
Washington	18.0	20.0	2.0	13.0
Danville, Va.	19.0	23.0	5.0	13.0
Norfolk	19.0	23.0	5.0	13.0
Petersburg	19.0	23.0	5.0	13.0
Roanoke	19.0	23.0	5.0	13.0
Richmond	19.0	22.0	5.0	13.0
Ch'rlst'n, W. Va.	18.0	22.0	4.0	13.0
Keyser	18.0	22.0	4.0	13.0
Parkersburg	18.0	22.0	4.0	13.0
Wheeling	18.0	22.0	4.0	13.0
Charlotte, N. C.	18.0	22.0	4.0	13.0
Hickory	18.0	22.0	4.0	13.0
Mt. Airy	18.0	22.0	4.0	13.0
Salisbury	18.0	22.0	4.0	13.0
Ch'lston, S. C.	19.0	23.0	5.0	13.0
Columbia	19.0	23.0	5.0	13.0

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Albany, N. Y.	18.0	20.0	...	15.0
New York*	16.0	18.0	...	15.0
Buffalo	17.0	19.0	...	14.0
Rochester	17.0	19.0	...	14.0
Syracuse	17.0	19.0	...	15.0
Boston, Mass.	18.0	20.0	2.0	15.0
Augusta, Me.	20.0	22.0	4.0	15.0
Manch't'r, N.H.	20.0	22.0	4.0	15.0
Burlington, Vt.	20.0	21.0	4.0	15.0

*Prices in steel barrels.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
N.Orleans, La.*	17.5	20.5	5.0	16.0
Baton Rouge	16.0	19.0	4.0	14.5
Alexandria	17.0	20.0	4.0	16.0
LaFayette	17.0	20.0	4.0	15.5
Lake Charles	17.5	20.5	4.0	16.0
Shreveport	16.0	19.0	4.0	15.0
Knoxv'le, Tenn.	19.0	22.0	3.0	16.0
Memphis	17.0	20.0	3.0	12.5
Chattanooga	18.5	21.5	3.0	16.0
Nashville	18.0	21.0	3.0	16.0
Bristol	19.0	22.0	3.0	14.0
Lit. Rock, Ark.	19.0	22.0	3.0	13.0

*Tax of 5 cents includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax and 1-cent parish tax.

OHIO

Standard Oil Co. (Ohio)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
All Ohio points	19.0	20.0	3.0	12.0

PENNSYLVANIA-DELAWARE AND PART NEW ENGLAND

The Atlantic Refining Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Pittsburgh, Pa.	15.0	*20.0	...	14.0
Philadelphia	15.0	*20.0	...	14.0
Scranton	15.0	*20.0	...	14.0
Allentown	15.0	*20.0	...	14.0
Altoona	15.0	*20.0	...	14.0
Erie	15.0	*20.0	...	14.0
Dover, Del.	18.0	20.0	3.0	14.0
Wilmington	18.0	20.0	3.0	14.0
Springf'd, Mass.	18.0	20.0	2.0	15.0
Worcester	18.0	20.0	2.0	15.0
Boston	18.0	20.0	2.0	15.0
Providence, R.I.	18.0	20.0	2.0	15.0
Hartford, Conn.	18.0	20.0	2.0	14.0
New Haven	18.0	20.0	2.0	15.0

*Includes tax of 3.0 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the state.

TANK WAGON CHANGES

December 12—Standard Oil Co. of Kentucky reduced the gasoline tank wagon price 1 cent in Lexington, Ky.

January 12—Standard Oil Co. of Louisiana reduced the gasoline tank wagon and station prices 1.5 cents in Shreveport, La. to 16 cents and 19 cents.

January 14—Continental Oil Co. reduced the gasoline tank wagon and station prices 1 cent in Denver, Colo. to 16 cents and 19 cents.

January 15—Atlantic Refining Co. advanced the gasoline tank wagon price 1 cent to 19 cents and the station price 2 cents to 20 cents throughout Massachusetts to partly equalize the new 2-cent state tax. Throughout Rhode Island and Connecticut the tank wagon price was reduced 1 cent to 19 cents. Kerosene prices were advanced 1 cent in Massachusetts, Rhode Island and in New Haven, Conn.

January 16—Standard Oil Co. of Kentucky reduced the gasoline tank wagon and station prices 2 cents in Birmingham, Ala. to 20 cents and 22 cents.

January 17—Standard Oil Co. of Kentucky reduced kerosene 3 cents in Birmingham, Ala. to 13 cents.

Atlantic Refining Co. reduced the gasoline tank wagon price 1 cent throughout Massachusetts, Rhode Island and Connecticut, making the new price 18 cents.

January 18—Standard Oil Co. of New York reduced the gasoline tank wagon price 1 cent throughout New England to 16 cents not including tax and reduced the tank wagon and station prices to 17 cents and 19 cents respectively throughout New York with the exception of New York city which remained unchanged.

January 19—Standard Oil Co. of Kentucky advanced the gasoline tank wagon price 3 cents and the station price 4 cents in Montgomery, Ala. to 23 cents and 25 cents.

January 22—Standard Oil Co. of New Jersey reduced the gasoline tank wagon price 1.0 cent throughout territory with the exception of Delaware. Standard Oil Co. of New York reduced the gasoline tank wagon and station prices 1.0 cent in New York City.

CRUDE OIL PRICE CHANGES

January 18—Standard Oil Co. of California reduced all unrefinable California crude below 24 gravity from 15 cents to 25 cents, setting 50 cents as the base price for the 14 gravity oil. The individual changes are shown in the regular price table.

GASOLINE TAX FOR NEW YORK APPEARS ASSURED

NEW YORK, Jan. 21.—Sentiment in legislative circles at Albany, the New York capital, indicate that the current session of the legislature will witness the enactment of a state gasoline tax amounting probably to 2 cents a gallon.

A general conference on farm relief held in the assembly chamber at Albany this week under Republican auspices disclosed a virtual unanimity of sentiment favoring imposition of a gasoline tax as the initial step for modifying rural tax burdens.

Coincidently with this conference Governor Roosevelt's Farm Relief Commission, through Henry Morgenthau, Jr., its chairman, announced a preliminary program calling for a gasoline tax of 2 cents per gallon, at least 40 per cent of the proceeds of which would be turned back to the counties to meet increasing highway costs.

The gasoline tax plan recommended by the Governor's commission includes the following points:

1. That there be enacted a 2-cent gasoline tax law.

2. That of the revenue to be derived therefrom at least 40 per cent thereof shall be used and applied to effect an equalization of the burden of constructing county highways and to relieve the towns of their respective shares of the cost of maintenance thereof, the remainder to be apportioned to the counties for the purpose of using and aiding them in developing a secondary or lateral system of improved highways.

CRUDE OIL PRICES

(Continued from Page 137)

Greybull-Torchlight	1.40
Cat Creek (Montana)	1.40
Sunburst (Montana) (May 18, 1928)	1.40
Artesia	1.40
Hogback (New Mexico)	1.40

Note—Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies post Grass Creek light and Elk Basin.

SOUTH CENTRAL AND SOUTHWESTERN TEXAS

Luling (January 11)*	$ .40
Mirando (January 7)†	.40
Rockdale-Minerva (April 15)‡	
Below 28 gravity	1.25
28-38.9 gravity	1.27
39-39.9 gravity	1.30
40 and above	1.31
Thrall‡	
Callihan (May 15)	1.75
Lytton Springs (Lockhart)	See gravity table
Somerset	See gravity table

*Posted by Magnolia Petroleum Co.
†Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co.
‡Thrall prices same as North Central Texas less 19½ cents per cwt. freight.

EASTERN STATES

(Effective January 4, 1929)

Penna Grade Oil in New York Transit Lines (New York)	$4.10
Bradford District Oil in National Transit Lines (Pennsylvania)	4.10
Penna Grade Oil in National Transit Lines (Pennsylvania)	4.00
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	4.00
Penna Grade Oil in Eureka Pipe Line Lines (Pennsylvania)	3.90
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.85
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia) (July 13)	1.55
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s Lines (December 17)	1.80
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s Lines (December 17)	1.80
Somerset Oil in Cumberland Pipe Line Lines (Kentucky) (Sept. 14, 1928)	1.75
Ragland Grade Oil in Cumberland Pipe Line Lines (Kentucky) (August 1)	.85

MIDDLE WESTERN STATES

Ohio Oil Co.
(Effective July 27, 1928)

Lima	$1.80
Wooster (October 17)	1.77
Illinois	1.55
Indiana	1.57
Princeton	1.55
Plymouth	1.58
Waterloo (November 17, 1926)	1.55
Western Kentucky* (Sept. 17, 1928)	1.65
Midland, Mich (January 15, 1929)**	1.70
Saginaw, Mich., Saginaw Sand (February 10)†	1.80
Saginaw, Mich., Berea Sand (February 10)†	1.70
Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky, (March 16)‡	1.50
Oil in lines in Stoll Oil Refining Co. in Oil City, Ky. (Oct. 1, 1928)§	1.70
Oil Springs (Canada)¶	2.07
Petrolia (Canada)¶	2.00

*Posted by Ohio Oil Co.
†Posted by Sun Oil Co.
‡Posted by Paragon Development Co.
§Posted by Stoll Oil Refining Co.
¶Posted by Imperial Oil Co., Ltd.
**Posted by Pure Oil Co.

MEXICAN CRUDE

Panuco heavy (f.o.b. Mexican ports)	$1.15

Note—Due to the fact that the exportation of Tuxpan light crude has become a negligible factor, prices will no longer be published.

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Oil Securities Heavy, Little Buying

Skelly Oil Co. Issues Made Sharp Advances. Call Money at 6 Per Cent Eased the Trading Situation Materially

By Special Correspondent

In an oil market which was perceptibly weak, Skelly Oil made sharp advances on Monday of this week. There were rumors that the Fisher Brothers interests had become identified with this concern, and they were not denied by officials of the Skelly company.

The majority of the oils lost considerable ground last week, when they were heavy, with little buying power evident.

Call money prevailing at the 6 per cent rate for the best part of the week eased the trading situation greatly.

New Oil Investment Trust

A new investment trust with initial capital of about $100,000,000, formed for the purpose of holding securities of various oil companies, is in the final stages of organization. Banking quarters understand that Blair & Co., Inc., will head this new trust.

Public offering of stock is looked for in the next 10 days. Initial capital of approximately $100,000,000 is to be raised through issuance of about 3,000,000 shares at a price around $35. Capital lineup of the new trust is expected to be entirely in one class of stock with 10,000,000 authorized shares, of which initial offering will represent about one-third.

Initial holdings of the trust probably will consist of Prairie Oil & Gas Co. and Prairie Pipe Line Co. stock. Early last December a group, headed by Blair-Fisher-Cutten interests, acquired from several Rockefeller philanthropies 14 per cent of the stock of Prairie Pipe Line Co. and 11 per cent of the stock of Prairie Oil & Gas Co. shares.

Acquisition of the two Prairie stocks at that time represented upwards of $48,000,000 market value. It consisted of 264,000 shares of Prairie Oil & Gas stock and 115,000 shares of Prairie Pipe Line. Since then the Prairie Pipe Line shares have been reduced to $25 par from $100 and a 25 per cent stock dividend has been paid. This resulted in a five-for-one exchange of the old shares.

The new investment trust, on present plans, will have a board of directors which will be representative of the various branches of the oil industry, as well as diversified geographically, and will include representatives of various banking interests.

John H. Markham, independent oil producer of Tulsa, has been selected, it is reported from New York, to head the new company which is to be known as the Petroleum Corp. of America. Mr. Markham was in New York early in the week.

South Penn Oil

Stockholders of South Penn Oil Co. have voted to increase the capital to $30,000,000 from $20,000,000. Directors declared a stock dividend of one-half share for every share held, payable to stockholders of record February 14. There will be no half shares issued. This is equivalent to a 50 per cent stock dividend. J. S. Van Devenger, general auditor, was elected a director to take the place made vacant by the death of Joseph Seep.

Washington Oil

Stockholders of Washington Oil Co. ratified increase in authorized capital stock to 40,000 shares from 20,000 of $25 par value. The new stock is to be issued from time to time.

Texas Pacific Coal & Oil

Texas Pacific Coal & Oil Co. declared a stock dividend of 2½ per cent, payable March 20 to stock of record February 23.

Texon Oil & Land

Exchange of Texon Oil & Land Co.'s 943,723 shares of new no-par stock for 4,718,615 shares of $1 par value, on basis of one new share for each five old shares, will be made by Security Transfer & Registrar Co. starting January 21. As no fractional shares will be issued, Security Transfer & Registrar Co. is authorized to buy or sell fractional shares at the rate of $4 a share of old stock.

In a letter to stockholders, Frank T. Pickrell, vice president, states that since termination of suit brought by the State of Texas against Texon, its subsidiaries and others interested in the Reagan County Field, Reagan County Purchasing Co., Inc., in which Texon companies and the Big Lake Oil Co. each own a 24½ per cent stock interest, has paid dividends totaling $3,400,000. By reason of dividends from this source and its own earnings, Big Lake Oil Co., in which Texon and Group No. 1 own a 25 per cent stock interest, paid a dividend of $700,000 on December 17, 1928, and has declared a dividend of $800,000 payable February 1. Texon companies have received more than $1,000,000 in dividends from these sources and on February 1, Texon and Group No. 1 will receive an additional $200,000 from the Big Lake dividend. It is the intention of the management to pay dividends on the new no-par value stock of not less than $2 a year, payable quarterly, he states. Directors will meet at El Paso, Tex., January 26, 1929, to adopt a dividend policy consistent with earnings.

Cities Service

Cities Service Co. for year ended December 31, 1928, reports profit after expenses, interest and preferred dividends of $22,876,755 available for common stock and reserves, comparing with $22,604,925 in 1927.

December profit available for common stock and reserves was $2,217,467, compared with $2,010,696 in December of previous year.

Statement for December and 12 months compares as follows:

	1928	1927
Dec. gross	$3,339,326	$2,867,684
Net after int., etc.	2,731,264	2,578,325
Surp. after pfd. divs.*	2,217,467	2,010,696
12 months gross	34,744,597	33,061,962
Net after int., etc.	29,649,959	29,412,831
Surp. after pfd. divs.*	22,876,755	22,604,925

*Available for common dividends and reserves.

Cities Service Co. declared regular

TWENTY REPRESENTATIVE STOCKS

The Oil and Gas Journal weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb was as follows:

Jan. 19	85.33	Dec. 3	83.67	Oct. 13	68.03
Jan. 14	83.32	Nov. 26	83.56	Oct. 6	67.55
Jan. 7	84.10	Nov. 19	80.55	Sept. 29	67.93
Dec. 31	80.19	Nov. 12	78.27	Sept. 22	67.12
Dec. 24	78.43	Nov. 5	75.99	Sept. 15	67.06
Dec. 17	78.43	Oct. 29	75.02	Sept. 8	66.76
Dec. 10	77.65	Oct. 20	70.05	Sept. 1	65.96

OIL BONDS ON THE NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members New York Stock Exchange
Kennedy Bldg., Tulsa, Okla.

Amount outstanding	Company—	Date	Pct.	Int.	For week ended Jan. 18— Sales	High	Low	Close
.....	Atlantic Refining Co.	July 1937	5	J&J	8,000	102¼	102¼	102¼
18,864,500	Barnsdall Oil with war.	Dec. 1940	6	J&D	116	138	135½	135¾
6,000,000	Barnsdall Oil without war..	Dec. 1940	6	J&D	130	99⅞	99¾	99¾
11,400,000	California Pet. conv. deb. ..	Nov. 1938	5½	M&N	22	103	102½	103
7,400,000	California Pet. conv. deb. ..	Feb. 1939	5	F&A	24	101¼	100¾	101¼
.....	General Petroleum	Aug. 1940	5	F&A	No sales.			
25,000,000	Humble O. & R. deb.	July 1932	5½	J&J	43	101¾	100½	101½
24,239,000	Humble O. & R. deb.	Apr. 1937	5	A&O	5,800	100½	100	100
10,103,000	Mid-Cont. Pet. Corp.	Mar. 1940	6½	M&S	21	105	105	105
3,745,000	Pan-American Pet. & T.	Aug. 1930	7	F&A	5	104⅝	104½	104⅝
10,161,900	Pan-American Pet. & T.	Nov. 1934	6	M&N	18	104⅜	104	104½
40,000,000	Phillips Pet.	June 1939	5¼	J&D	3	93⅜	93	93½
.....	Pierce Oil deb.	June 1931	8	J&D	3	106¾	106¾	106¾
.....	P. & R. Corp.	Dec. 1931	8	J&D	No sales.			
.....	P. & R. Corp. without war..	June 1931	8	J&D	1	111¾	111¾	111¾
20,000,000	Pure Oil	Aug. 1937	5½	F&A	42	100	99¾	100
30,000,000	Shell Pipe Line Co.	Nov. 1952	5	M&N	88	96¾	96¼	96½
50,000,000	Shell Union Oil Co.	May 1947	5	M&N	67	98⅞	98⅛	98⅜
3,431,500	Simms Pet. Co.	Nov. 1929	6	M&N	No sales.			
44,816,500	Sinclair Co. Oil Co. A	Mar. 1937	7	M&S	51	103	102½	102¾
23,086,500	Sinclair Co. Oil Co. B	Mar. 1938	6½	J&D	56	101¾	101	101¾
20,000,000	Sinclair Co. Oil Co. D	Sept. 1930	6	M&S	91	100	99¼	99⅝
.....	Sinclair Cr. Oil Pur. Co. A...	Jan. 1938	5½	J&J	64	97½	97	97⅛
.....	Sinclair Pipe Line Co.	Oct. 1942	5	A&O	46	94½	93¾	94½
15,000,000	Skelly Oil Co.	Mar. 1939	5½	M&S	24	93½	93	93½
.....	Standard Oil of N. J.	Dec. 1946	5	F&A	106	103	102¾	103
.....	Standard Oil of N. Y.	Dec. 1951	4½	J&D	63	97⅞	96⅞	96⅞
.....	Union Oil of Calif.	Jan. 1931	5	J&J	No sales.			
.....	Superior Oil Co.	Feb. 1929	7	F&A	No sales.			
8,934,500	Union Oil of Cal. 20 yr. A....	May 1942	6	F&A	5	109	108⅝	109
9,419,000	Union Oil of Cal. series C ..	Feb. 1935	5	A&O	7	100¼	100	100¼
4,870,000	White Eagle Oil & Ref.	Mar. 1937	5½	M&S	44	104⅛	103½	103½

INDEPENDENT OILS ON THE NEW YORK CURB

Quotation Compiled by Francis, Bro. & Co., Kennedy Building, Tulsa, Okla.
Members New York Curb Market

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Par Value	Stocks	For week ended January 19— Sales	Open	High	Low	Last	Change
$6.75	.45	2⅞	.55	1½	.53	$5	Amer. Con. Oilfields	18,800	72	72	63	67	+ 3
..	..	7½	2¾	9½	3⅛	N.P.	Amer. Maracaibo	11,300	8	8	7⅛	7¼	— ⅜
..	..	2¾	1	4½	2¼	$10	Argo Oil	700	....	3¼	3	3	....
85¼	60	40	20½	55	32¾	N.P.	British American	100	....	31¼	31¼	31¼	+ 1½
28⅜	9¼	28¼	15½	4½	3⅞	25c	Carib. Syndicate (new)	3,600	4¼	4¼	4	4	....
..	..	58¾	40¼	90⅞	54	$20	Cities Service	49,800	89⅝	91¼	88⅛	89½	— 1
..	..	95⅜	87	103½	94½	100	Cities Service, pfd.	1,800	98⅛	98⅝	97¾	98	— ½
..	..	8⅞	7⅞	9⅝	8⅞	10	Cities Service, pfd. B	100	9	9	9	9	— ⅛
3½	1¾	3⅞	1⅛	3¼	76	1	Colombia Syndicate	33,900	1⅛	1¾	1⅛	1½	+ ⅛
..	..	9¾	6¾	8⅞	6¼	10	Consolidated Royal	800	....	8⅛	6⅞	7¾	— ⅜
16	10	14⅞	9½	17½	9½	N.P.	Creole Syndicate	16,500	10⅞	11	10⅜	10½	— ⅜
..	..	3	.50	3¼	.76	N.P.	Crown Central	2,400	....	1⅝	1⅜	1⅜	— ¼
7⅞	6¾	12	4	33½	3¼	N.P.	Darby Petroleum	8,500	24¾	26	24¾	25⅞	+ 1⅜
..	..	2½	74	2¼	1	N.P.	Derby Oil & Refining	2,800	....	5	4½	4⅝	— ⅛
..	..	16¾	4	21⅛	7½	N.P.	Derby Oil & Refining, pfd.	1,700	....	27½	25⅛	25⅛	....
..	..	2	.40	.53	.15	N.P.	Gilliland ctfs.	No sales.					
98	92	118	86¼	165	101⅛	$25	Gulf Oil Corp.	28,100	160¼	161	156¼	160⅛	— ¾
$3.00	.83	2½	.80	3⅜	1	5	Intercontinental Pet.	24,400	2	2⅛	2	2	....
..	..	2¼	1⅛	3	1¼	N.P.	Kirby Petroleum	5,400	2⅞	2⅞	2¼	2½	— ½
12¼	5¾	10⅞	5½	9⅜	5⅛	25	Leonard Oil & Dev.	2,800	5½	5¼	5⅛	5¼	— ⅜
27	20	27½	20	43⅞	20	N.P.	Lion Oil & Refining	2,800	32¾	33	32¾	32⅞	+ ½
46	30	59⅜	37	69⅛	48¼	$25	Lone Star Gas	8,400	67	71	67	71	+ 3¾
2⅞	1	2⅞	.80	1⅞	.50	1	Magdalena Syndicate	4,800	68	68	60	67	+ 7
34	12½	52	12	48½	32	N.P.	Margay Oil	1,200	....	38	35	36	+ 1
8	5½	12¼	5	8	2¾	N.P.	Mexico-Ohio Oil	No sales.					
1¾	1⅛	1½	1	1¾	.76	$1	Mountain & Gulf	3,100	....	1½	1⅜	1½	....
26	23	29¼	22¾	28⅞	19½	10	Mountain Producers	2,400	20	20⅛	19½	19½	— ½
6⅝	5	5⅞	4⅝	5⅝	4¼	5	New Bradford	900	4⅞	5	4¾	4¾	— ⅛
..	..	16	9¼	11⅞	7⅛	1	New Mex. & Ariz.	2,000	8⅛	8½	7⅝	8	+ ½
..	..	12¾	9½	14¼	8½	N.P.	North Central Texas	2,000	....	10⅛	9⅝	10⅛	+ ⅛
10¼	5⅞	9⅜	3¼	6	2¼	N.P.	Pandem	12,300	2¼	2⅜	2	2⅛	— ⅛
12¼	11¾	12⅛	7	15⅝	8½	N.P.	Pantepec Oil	3,500	10	10⅛	10	10	....
22¾	12	13½	5⅛	7⅜	4⅞	N.P.	Pennok Oil	800	....	6¾	6½	6½	— ¼
17	8½	24⅜	7	18	4⅞	25	Red Bank Oil	400	12¼	12¼	12¼	12¼	....
30¼	12	15½	3½	12⅞	4⅛	N.P.	Reiter-Foster	1,900	6⅞	6⅞	6¼	6⅜	— ⅜
7	4½	7	4½	12	4⅛	N.P.	Ryan Consolidated	3,200	....	8⅞	8	8¾	— ⅜
10	7⅛	8	5¼	7¼	5½	$10	Salt Creek Cons.	1,900	....	5¾	5¼	5½	....
35	24⅛	35½	27¼	35	23⅛	10	Salt Creek Prod.	3,400	25	24⅜	24⅛	24⅞	— ⅜
6⅞	1¼	7	1¼	3½	1	5	Savoy Oil	No sales.					
27	7⅝	26½	17	22⅞	13	10	Tidal Osage	400	14¾	14¾	14¾	14¾	+ ⅛
25¾	7⅝	23¾	15	21¼	13⅛	10	Tidal Osage, nonvoting	1,500	13⅜	13½	13⅛	13¼	— ⅜
92	63½	92	63½	93¾	75	100	Transcontinental, pfd.	100	85½	85½	85½	85½	— 2
8	4½	7⅜	4¼	9⅛	4⅜	5	Venezuelan Petrol	11,800	5¾	5⅞	5½	5⅝	— ⅛
8⅛	5½	8	4⅜	8¼	4⅞	$1	Woodley Petroleum	400	....	6	5¾	6	— ⅛
6½	6	6	1¾	8⅜	2⅛	25	Y Oil & Gas (new)	2,100	....	4⅝	3⅝	4⅜	— ⅜

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of New York Stock Exchange, Kennedy Building, Tulsa, Okla.

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low		Listed capital	Par value	Stocks—	Div. rate	Last paid	For week ended January 19 Sales	Open	High	Low	Last	Change
32⅞	24¼	37⅝	27⅝	43⅞	27⅛	(sh)	922,075	N.P.	Amerada Corp.	50cQ	Oct. 31, 28	6,800	39¼	39⅛	37⅛	37⅛	— 2⅞
74	39⅞	82½	35⅛	85	51¼	(sh)	209,180	N.P.	American Republics Corp.	.....	.....	3,400	58⅝	60¾	57⅛	58¼	— ¼
60	44¾	50¼	35	53⅜	37½		$57,260,300	$25	Associated Oil	50cQ	Dec. 31, 28	†30,000	46	47	45	46¼	+ ¾
128⅜	97	131⅜	104	66⅜	50		50,000,000	25	Atlantic Refining	25cQ	Dec. 15, 28	97,900	61⅞	64	61⅜	62⅜	— ⅛
33½	23½	35½	20¾	53	20		35,194,000	25	Barnsdall Corp.	50cQ	Feb. 5, 29	83,800	43⅝	44¼	43	43⅜	— ¼
94¼	50	96¾	65	94⅞	68		20,785,400	100	General Asphalt	.....	.....	17,300	80⅜	80⅜	75½	77	— 3⅜
72	50¼	175¾	60¼	167	79		25,000,000	100	Houston Oil	.....	.....	5,200	95¾	100	90⅜	94½	— ½
34	19⅝	32¾	17⅝	38⅜	21¾	(sh)	959,457	N.P.	Independent Oil & Gas	50cQ	Jan. 31, 29	16,700	32	32½	31	31¾	— ¾
12¾	7½	12⅛	7⅝	39⅝	9		8,203,080	$10	Indian Refining	.....	May 31, 24	32,200	33⅝	34⅜	32	33⅜	— ⅜
25⅞	16½	37⅜	20½	39¼	27⅜	(sh)	3,992,122	N.P.	Lago Oil & Transport	.....	May 1, 27	1,700	30½	31½	30⅛	30⅜	+ ⅛
19⅞	12	18⅛	10	19⅜	9⅜	(sh)	1,237,078	N.P.	Louisiana Oil Refining	.....	.....	28,900	17½	17½	16	16¼	— 1⅛
28	16½	22¾	12	25½	12½	(sh)	330,000	N.P.	Maracaibo Oil	.....	.....	2,500	16	16½	16	16½	+ ⅛
63⅜	49¼	58½	31	49⅜	33	(sh)	2,316,692	N.P.	Marland Oil Co.	.....	Mar. 31, 27	48,500	43⅛	44¾	42	43	— 1
13⅜	6	9¼	3	73	4⅝	(sh)	945,939	N.P.	Mexican Seaboard	.....	Dec. 15, 20	126,300	58	60	57	59	....
37	20½	39⅜	25½	44½	25⅛	(sh)	1,357,461	N.P.	Mid-Continent Petroleum	50cQ	Feb. 15, 29	20,300	35⅜	35¾	34½	34⅝	— ⅝
104¼	90	105	97	120½	103¼		$6,718,000	$100	Mid-Continent Petroleum pfd.	$1.75Q	Sept. 1, 28	100	120¼	120¼	120¼	120¼	— ¾
2½	½	3¾	1⅝	7⅜	2⅜		24,298,850	10	Middle States	.....	July 1, 23	11,800	4⅞	4⅞	4½	4½	— ¼
76½	56⅛	65⅞	40¼	54⅞	38¼		$48,807,400	$50	Pan American P. & T.	.....	Oct. 20, 27	3,700	47¼	49¾	46¾	48⅜	+ 1⅜
78⅜	56⅞	66⅜	40¼	58⅞	37¾		121,097,900	50	Pan American P. & T. B	.....	Nov. 15, 24	57,600	48⅛	50¾	47	48½	....
46	30	37⅞	16¾	28⅜	15½	(sh)	400,000	N.P.	Pan American Western B	.....	Jan. 30, 27	800	17¾	18½	17½	17½	— ¼
32	4½	18⅞	8	21¾	11½	(sh)	198,770	N.P.	Panhandle P. & R.	.....	.....	1,100	13¼	13½	12½	13	— ¼
99⅜	51	83	54	108	70		$2,935,200	$100	Panhandle P. & R. Pfd.	.....	July 2, 23	100	76	76	76	76	+ 1
57⅜	40	60¼	36¼	53⅞	35¼	(sh)	2,406,796	N.P.	Phillips Petroleum	37½cQ	Jan. 2, 29	35,200	43	43	41⅝	42	— 1⅜
....	....	1⅜	½	5¼	½		$29,622,925	$25	Pierce Oil Corp.	.....	.....	9,200	2¾	2¾	2½	2¾	+ ⅛
7	2¼	5½	2½	7	3½	(sh)	2,500,000	N.P.	Pierce Petroleum	.....	.....	25,700	5⅜	5⅜	5⅛	5½	....
60¼	48	55½	45⅝	68	46		60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	1,003	....	64¾	61¼	64	+ 3½
20⅜	11	33⅞	16¾	29⅞	16		$37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	1,000	23¾	23¾	22⅝	22⅝	— ⅛
41⅜	30¾	50	36⅞	49⅝	41		2,845,350	50	Producers & Refiners pfd.	.....	May 1, 25	*11,000	42	42	41⅞	42	— 1
31	25¼	33½	25	31⅝	19		75,959,350	25	Pure Oil Co.	25cQ	Dec. 1, 28	27,900	26¼	26⅜	25¾	26	+ 1⅜
27½	22	28⅝	25⅜	56	23		47,025,000	$25	Richfield Oil	.....	Nov. 15, 28	9,000	45¼	46	44¼	45	— ¾
57⅜	47⅜	54½	44¼	64	44⅝	(sh)	611,303	13.40	Royal Dutch, N. Y. shares	50cQ	Jan. 10, 29	3,500	53½	54½	53¼	54¼	....
48⅝	40½	47⅞	41⅜	57½	40⅝	(sh)	£30,000,000	£1	Shell Transport & T.	$1.455	July 23, 28	No sales.					
31	24	31¾	24⅝	39¼	23¼	(sh)	20,000,000	N.P.	Shell Union Oil	35cQ	Dec. 31, 28	62,300	28¾	28⅞	28	28⅜	— ½
28⅜	15⅛	26⅜	14¼	27¼	18⅛		$8,357,000	$10	Simms Petroleum	10cQ	Dec. 15, 28	11,400	22	22½	21½	22¼	+ ⅛
24⅞	16¾	22⅜	15	46¾	17⅜	(sh)	4,501,915	N.P.	Sinclair Consolidated	.....	.....	376,500	41⅞	42½	40⅜	41½	— ½
99½	90	104½	97	110	102½		$16,604,600	$100	Sinclair Consolidated pfd.	$2Q	Nov. 15, 28	600	109½	109¾	109½	109¾	+ ¾
37⅛	26⅝	37⅜	24¼	42⅝	25		27,396,590	25	Skelly Oil Co.	50cQ	Dec. 15, 28	45,400	34½	39½	34	38½	+ 3½
63⅝	51½	60¾	50⅜	80	53	(sh)	12,594,098	N.P.	Standard Oil of California	65½cQ	Dec. 15, 28	85,500	69	71	68½	70½	+ 1¾
46⅜	37½	41⅜	35⅛	59⅜	37¾		$611,120,700	$25	Standard Oil of New Jersey	25cQ*	Dec. 15, 28	106,100	52⅛	52¾	51⅝	52⅜	— ⅛
47⅛	30⅜	34⅛	29¾	44¼	28¾		427,973,275	25	Standard Oil of New York	40cQ	Dec. 15, 28	575,900	42⅜	45¾	42	45	+ 2⅜
41⅝	30⅛	34⅞	30	77	31½	(sh)	1,206,073	N.P.	Sun Oil	25cQ	Dec. 15, 28	1,700	66½	56⅞	64⅛	64¼	— 2⅜
5¼	1	6½	3⅛	14¼	2½	(sh)	1,267,000	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	34,200	10⅜	10⅛	9½	9⅜	— ¼
58	48	58	45	74⅜	50		$211,076,650	$25	The Texas Corporation	75cQ	Jan. 1, 29	93,100	64¼	66¾	53⅝	64⅛	— ¼
19½	12	18⅞	12	26⅝	12¼		8,380,340	10	Texas Pacific Coal & Oil	.....	Jan. 3, 28	53,000	17⅞	18	16	17½	+ ⅝
39¼	27	29⅛	19	41½	19⅝	(sh)	2,168,410	N.P.	Tide Water Oil Co.	20cQ	Dec. 15, 28	3,900	36	37	36	37	+ 1
108	87¼	90¼	85	100¼	86		$20,705,200	$100	Tide Water Oil Co. 5% pfd.	$1.25Q	Nov. 15, 28	1,200	....	97½	96¼	96¼	+ ¼
27	20⅞	19¼	15⅜	25	14⅜	(sh)	4,796,158	N.P.	Tide Water Associated	.....	Aug. 1, 27	18,500	20¼	20⅝	20	20¼	....
5½	3	10⅜	3¾	14⅜	7¼	(sh)	3,742,029	N.P.	Transcontinental Oil	.....	.....	40,600	11⅞	11⅞	11	11	— ½
58⅜	37¼	56½	39⅝	58	42¾		$94,798,100	$25	Union Oil of California	50cQ	Nov. 10, 28	26,800	48⅝	52¼	48¼	51⅜	+ 2⅝
120⅜	84¼	127½	94	128¼	110		31,061,200	100	Union Tank Car Co.	$1.25Q	Dec. 1, 28	3,600	121⅞	133½	121⅞	133½	+11½
30¼	23½	34½	24½	44⅞	26	(sh)	356,000	N.P.	Warner Quinlan	50cQ	Jan. 2, 29	18,100	38⅜	39¾	36¾	39¼	+ 1¼
29⅜	25⅛	27½	20	38	20⅛	(sh)	490,000	N.P.	White Eagle Oil & Refining	50cQ	Jan. 20, 29	700	34½	35	34⅛	34⅜	— ⅜
									Wilcox Oil & Gas	.....		2,400	21½	21½	20½	21½	....

*Also extras. †Ex-dividend.

STANDARD OIL STOCKS ON NEW YORK CURB

21	16	21⅝	17¾	22⅜	14⅞		£4,126,460	£1	Anglo-American Oil	.....	June 6, 28	8,800	....	16⅞	15	16	+ ⅝
....	....	3¾	¾	5	1¼	(sh)	500,000	N.P.	Atlantic Lobos	.....	.....	600	2¼	2¼	2¼	2¼	+ ¼
76	65	69	50	56½	44½		1,000,000	25	Borne Scrymser	$18.A.	Oct. 15, 28	350	43	40¼	43	....	+ ¼
50½	42	60	45	76	53		10,000,000	50	Buckeye Pipe Line	$1Q	Dec. 15, 28	800	70¼	74¼	73	73½	+ ¾
82½	65	126	76½	161	117½		3,000,000	25	Chesebrough Mfg.	$1Q	Dec. 28, 28	100	142½	143½	143½	143½	+ 1
25⅞	17½	22⅝	16¼	23	16		36,057,840	10	Continental Oil	.....	Dec. 15, 27	28,300	18¾	19½	18⅝	18⅞	+ ⅛
137	102	137	89	114	67		1,500,000	50	Cumberland Pipe Line	$1A	Dec. 15, 28	No. sales.					
63⅜	43	68½	47	88	64⅛		5,000,000	100	Eureka Pipe Line	$1Q	Nov. 1, 28	No. sales.					
32½	9⅞	13½	3½	13	4¼		16,000,000	100	Galena Signal Oil	.....	June 30, 25	100	6⅝	6⅝	6⅝	6⅝	+ ⅝
68½	52	68½	54	114⅜	59¼		73,117,577	25	Humble Oil & Refining	30cQ*	Jan. 1, 29	9,400	101	102½	98	98½	— 1½
144½	125½	182	123¾	290½	176½		20,000,000	100	Illinois Pipe Line	10%S.A.	Dec. 15, 28	850	299	302	298	302	— 4½
....	....	64¾	37¾	104	56¾	(sh)	6,458,267	N.P.	Imperial of Canada	25cQ	Dec. 1, 28	3,100	98	102⅞	101½	102	+ 6
72½	58	94½	61	91⅞	74⅜		$5,000,000	$50	Indiana Pipe Line	$1Q	Feb. 15, 29	800	90	90	89	90	....
35½	28¾	39	28¼	55	35	(sh)	7,123,444	N.P.	International Petroleum	25c	Nov. 30, 28	43,700	55½	60⅞	55¾	60⅞	+ 5½
20⅜	12½	24	13½	32⅜	19⅜		$6,363,350	12.50	National Transit Co.	25c	Dec. 15, 28	5,300	23½	25⅞	23¼	25⅞	+ 2⅜
51½	27¼	44½	31¼	75	38½		5,000,000	100	New York Transit	.....	July 15, 26	400	....	85	74	82	+ 8¼
80½	64	100	70	69	56½		2,000,000	50	Northern Pipe Line	$38.A.	Jan. 2, 29	No sales.					
67⅜	55⅜	67⅞	52	84	58½		60,000,000	25	Ohio Oil Co.	50cQ*	Dec. 15, 28	6,800	72⅛	72¼	70⅞	70⅞	— 1¼
24⅜	15	39	12	84	28		10,000,000	25	Penn Mex. Fuel	$1.25	Dec. 15, 28	400	36	36	36	36	+ ½
137½	122½	190	132	278	172		101,000,000	25	Prairie Pipe Line	$3.50	Oct. 31, 28	23,000	54⅜	56	54¼	55	....
220	84½	201½	175½	220	167		4,000,000	100	Solar Refining	$5S.A.	Dec. 20, 28	200	....	200½	200½	200½	+ ½
74½	61½	27¼	15½	19	15		1,000,000	10	Southern Pipe Line	$2	Dec. 1, 27	100	14	14	14	14	....
50	34½	41½	35	71⅞	36¾		2,000,000	25	South Penn Oil	50cQ	Dec. 31, 28	1,000	67	68	66⅝	67¾	+ ¼
56	47½	83	55½	102	70		3,500,000	100	Southwest Pa. Pipe Lines	$1Q	Oct. 1, 28	100	....	70	68	70	....
70½	60½	81½	64⅝	95⅞	70⅞		228,415,463	25	Standard Oil of Indiana	62½cQ	Dec. 15, 28	287,100	89¾	103¼	89¾	96	+ 6½
38½	16½	20⅞	14⅝	27¾	15		8,000,000	25	Standard Oil of Kansas	.....	June 16, 24	1,300	20¾	21⅛	20¾	21	....
134⅜	108	130	111½	179¾	122¼		17,012,559	10	Standard Oil of Kentucky	$1Q	Dec. 31, 28	9,200	44	45¼	43⅛	43½	....
51⅜	42	49½	40	54⅞	39¾		4,559,850	25	Standard Oil of Nebraska	63cQ	Dec. 20, 28	200	....	47⅛	47	47	— ½
372	288	87½	72	134	71		14,000,000	25	Standard Oil of Ohio	62½cQ	Jan. 2, 29	1,500	115	119	115	118¾	+ 3¾
21	15	21	14½	23½	16		861,000	25	Swan Finch Co.	.....	Nov. 1, 19	No sales.					
109⅜	90¼	....	....	111	72		125,619,000	25	Vacuum Oil	75cQ	Dec. 20, 28	39,700	117	129½	117	127¾	+11¾

*Also extras.

monthly dividends of 10 cents and one-half of 1 per cent in common stock on common stock, 50 cents each on preferred and preference BB stocks, and 5 cents on preference B stock, all payable March 1 to stock of record February 15.

Royal Dutch

Interim dividend of 10 guilders for 1928 declared on ordinary shares of Royal Dutch Co. is equivalent to $1.336 on each New York share and will be distributed by Equitable Trust Co. February 8 to stock of record January 25.

Venezuelan Petroleum

Venezuelan Petroleum Co., affiliated with Consolidated Oil Corp., declared the regular quarterly dividend of 5 cents on the $5 par stock, payable February 15 to stock of record January 31.

Solar Refining

Certificates for new stock of Solar Refining Co. will be ready for exchange for old stock certificates on February 4. Holders are requested to forward certificates to company's office at Lima, Ohio, for exchange on basis of four $25 par shares for each old share. No fractional shares will be issued, nor any dividend be paid hereafter on any fraction of a share. Stockholders entitled to fraction of a share of new stock will be paid cash at a value based on average closing price bid for full shares in the New York market from January 24, 1929, to February 4, 1929, inclusive.

Standard of Indiana

Standard Oil Co. of Indiana's second employes' stock purchase plan adopted at annual meeting in 1926 will expire March 31. Directors have therefore voted to adopt a third plan, subject to approval of stockholders at annual meeting March 7. Details of the stock subscription plan are

(Continued on Page 148)

FURNACE OILS IN DEMAND IN CHICAGO

(Continued from Page 130)

seems to have the less desirable qualities of both crudes as it has a high sulphur content and does not have the low cold test.

It was stated by a fuel oil man here that even the gas companies had relaxed some of the regulations regarding the amount of sulphur allowable in gas oil and that they are accepting shipments that they would have rejected a short time ago. This probably is true of some companies but for the most part they stick rather closely to their specifications.

The fuel oil market is now close to the peak of the season so far as buying is concerned. The next monthly purchases by those who order around the first of each month will cover the February requirements and by the latter part of next month the heavy season for the use of fuel oils for heating will be nearly past. These monthly buyers are the really large purchasers at present for the other large consumers have contracts or storage and are out of the market right now unless they take in a bargain as most of them will if it is really a bargain.

Lubricating Oil Business Quiet

The lubricating oil business is quiet, but prices have lost none of their strength. Bright stocks and steam refined stocks are strong. Bright stocks are being held at fully 10 cents a gallon higher than they were sold for by the same concerns last year. It is stated that the high prices already have resulted in more refineries putting in separators to run the material but the supply is still scant and the result of this increase in output is not going to be felt immediately.

One reason for the low supply of bright stocks is the large export demand. Our lubricating oils are more than holding their own even in those foreign countries where our other petroleum products have been displaced by other sources of supply. Refineries which last year had a big supply of bright stocks in storage to worry over, are sold ahead this season. Steam refined stocks are in the same condition.

Many refiners are using the system of running their motor oils in the stills and not producing the various oils and compounding them later which also reduces the quantity of these stocks run as such. Some refiners have advanced their prices on compounded oils such as motor oils from 1 to 4 cents a gallon, according to the amount of the expensive bright stocks which they contain. The demand for motor oils from distributors has been right in line with the reduced consumption of gasoline. Industrial oils are steady although in moderate request. Refiners state that the amount of early contracting has been large on the most wanted oils and many are well contracted ahead. In fact, the Pennsylvania refiners in many instances have declined to contract for a longer period than 30 days and contracts made with them are generally based on the price of crude.

No Change in Tank Wagon Scale

There has been no general change in the tank wagon scale over the territory and the major distributors do not look for any such general change in the early future. At several minor points there have been changes to meet local competition but these have been comparatively few and at no important points have there been any changes. Locally there have been some efforts made to secure uniformity of prices, but so far the results have been meager or practically none at all. One of the peculiar circumstances in the situation is the low prices quoted at some of the nearby Indiana points. The State tax is 3 cents in Indiana and gasoline is being sold at some stations in nearby towns at 14 cents. The same price is not uncommon in this city where there is no gasoline tax, which may be one way of giving the local customers in Indiana an even price with the low of the city prices.

The normal station price in Chicago is 16 cents. The new Governor of Illinois has recommended the passage of a 3-cent gasoline tax in Illinois and it seems well assured that some form of tax will be passed, the trouble being in the division of the receipts between the various spending bodies such as the State, the counties and even the cities. This will add 3 cents to the price of gasoline in Illinois and put an end to some active stations just this side of the border line between Illinois and the surrounding States, all of which have gasoline taxes.

There is no real opposition to the passage of such a tax law but there is a desire that it be such an act as will insure that the receipts go to the purpose for which the law will devote them, that is the building of new roads. The present revenue from automobiles and other forms of taxation applicable to roads is sufficient for the maintenance of the roads when built.

WEST TEXAS FIELDS

(Continued from Page 40)

located 500 feet south and east of northwest corner G. A. Kirkland Survey A-507 was dry and abandoned at 2,502 feet.

Howard County

Amerada Petroleum Corp.'s No. 4 Roberts, located 330 feet north and 2,310 feet east of SW cor. Section 128, Block 29, W.&N.W.R.R. Survey, made 75 bbls. hourly at 3,007-14 feet. Superior Oil Co.'s No. 8 Roberts made 2,840 bbls. at 2,940-50 feet. Green Oil Co.'s No. 3 Clay was shot with 60 quarts at 2,470-2,500 feet, drilled to a total depth of 2,545 feet and made 160 bbls. Marland and Texon Oil & Land Co.'s No. 4 Settles pumped 1,442 bbls. at 2,195-2,264 feet. Magnolia Petroleum Co.'s No. 12 Roberts, located 1,650 feet north and 330 feet east of Section 136, Block 29, W.&N.W.R.R. Survey, made 400 bbls. at 2,490-2,561 feet. Shermerhorn Oil Co.'s No. 4 Roberts, located 990 feet south and west of NE cor. Section 157, Block 29, W.&N.W.R.R. Survey, made 2,640 bbls. at 2,984-3,002 feet.

Stonewall County

Sun Oil Co.'s No. 1 Reynor, located 346 feet south and west of NE cor. Section 20, Block B, H.&T.C.R.R. Survey was dry and abandoned at 3,615 feet.

Sutton County

Phillips Petroleum Co.'s No. 1 Cawthorn was dry and abandoned at 975 feet.

Pecos County

Red Bank Oil Co.'s No. 1 M. A. Smith made 10 bbls. hourly at 1,725-1,855 feet.

Ward County

Shipley and others' No. 1 Hayzlett, located 2,310 feet northeast and 2,310 feet southeast Section 17, Block 5, H.&T.C. R.R. Survey, made 125 bbls. at 2,480-81 feet.

Winkler County

Amerada Petroleum Corp.'s No. 2 Cowden made 425 bbls., 2 per cent water at 3,068-75 feet. Shell Petroleum Corp. and others' No. 1 Daugherty, located 2,310 feet south and west of NE cor. Section 3, Block 75, made 87 bbls. at 3,120-35 feet. Atlantic Oil Producing Co.'s No. 6-E, located 330 feet from north and 990 feet from east of Section 41, Block B-5, topped the lime at 2,193 feet, topped the pay at 2,600 feet, was drilled to a total depth of 2,700 feet and had an initial production of 25,000 bbls. daily, 12 per cent water. Gulf Production Co.'s No. 25 Hendricks, located 1,650 feet from north and west of Section 34, Block B-5, topped the lime at 2,404 feet and had an initial production of 450 bbls. hourly at 2,841-3,065 feet. Humble Oil & Refining Co.'s No. 4 Hendricks-B, located 440 feet south and 2,310 feet west of Section 39, Block 26, topped the lime at 2,302 feet, topped the pay at 2,746 feet, was shot with 340 quarts at 2,796-2,882 feet and had an initial production of 80 bbls. daily, 50 per cent water. Humble Oil & Refining Co.'s No. 2 Hendricks-C, Lease 2, located 440 feet north and 330 feet west of Section 10, Block B-12, topped the lime at 2,415 feet, topped the pay at 2,830 feet, was drilled to a total depth of 2,902 feet and had an initial production of 444 bbls. hourly. Prairie Oil & Gas Co.'s No. 4 Cowden, located 440 feet south and 330 feet east of Section 3, Block B-12, topped the lime at 2,495 feet, and had an initial production of 888 bbls. at 2,905-27 feet.

Pure Oil Co.'s No. 6 Hendricks-A, located 2,310 feet south and 330 feet west of Section 41, Block B-5, was drilled to a total depth of 3,021 feet and made 127 bbls. of oil and 600 bbls. of water at 2,974-86 feet. Shell-The Texas Company's No. 6 Hendricks-B, located 1,320 feet north and 330 feet east of Section 41, Block 26, topped the lime at 2,376 feet, topped the pay at 2,768 feet, was drilled to a total depth of 3,075 feet, and had an initial production of 700 bbls. daily, 45 per cent water. Southern Crude Oil Producing Co.'s No. 1 Hendricks T-88-W, located 330 feet north and east of Section 5, Block B-12, topped the lime at 2,686 feet, topped the pay at 2,734 feet, was drilled to a total depth of 2,-995 feet and had an initial production of 415 bbls. daily. Its No. 3 Hendricks T-88-S made 110 bbls. hourly, 19 per cent water, at 2,675-2,703 feet. Wentz's No. 1 Morton, located 1,650 feet south and 330 feet east of NW cor. Section 27, Block B-12, had an initial production of 824 bbls. daily at 2,745-3,005 feet and is now pinched to 419 bbls. daily.

WINKLER COUNTY
Week Ending January 15
Hendricks Pool

Company, farm, section and block—	Wells	Prod.
Amerada Pet. Co.:		
Cowden, 3, B-12	2	662
Atlantic O. P. Co.:		
Hendricks-A, 34, B-5	8	1,544
Hendricks-B, 44, 26	3	471
Hendricks-D, 29, B-5	8	2,507
Hendricks-E, 41, B-5	5	7,278
Hendricks-G, 40, 26	7	2,706
Hendricks-H, 30, B-5	1	4
Atlantic & Collett:		
Hendricks-F, 40, 26	12	4,875
Bankers Prod. Co.:		
Hendricks, 30, B-5	1	164
California Co.:		
Hendricks, 29, B-5	8	1,533
Cranfill & Reynolds:		
Hendricks-A, 28, B-5	2	227
Hendricks-B, 35, B-5	1	113
Hendricks-C, 33, 26	2	309
Hendricks-D, 33, 26	1	off
Hendricks-E, 33, 26	2	526
Cranfill & Texon:		
Hutchings, 47, 26	1	90
Eastland Oil Co.:		
Hendricks, 33, B-5	2	476
Hendricks-B, 35, B-5	1	206
Gulf Prod. Co.:		
Hendricks-A, 34, B-5	13	3,665
Hendricks-B, 45, 26	11	8,750
Hendricks-C, 40, B-5	5	2,500
Hendricks, 44, 26	1	365
Cowden, 3, B-12	2	1,200
Humble Oil & Ref. Co.:		
Hendricks-A, 34, B-5	17	5,643
Hendricks-B, 29, B-5	6	1,168
Hendricks-C, 32, 26	8	1,071
Hendricks-D, 47, 26	5	1,046
Independent O. & G.:		
Hendricks-A, 34, B-5	7	1,760
Howe-B, 44, 26	2	155
McCabe, 36, B-5	2	438
Hendricks, 42, B-5	1	21
Vardeman-B, 41, B-5	6	1,095
Magnolia Pet. Co.:		
Hendricks, 29, B-5	8	855
Marland Oil Co.:		
Hendricks, 33, 26	4	1,486
Hendricks-A, 29, 26	2	278
Hendricks-B, 34, 26	1	100
May Prod. Co.:		
Hendricks, 34, 26	1	31
Mining & Exp. Co.:		
Hendricks, 10, B-22	1	149
Murchison & Cranfill:		
Hendricks-A, 35, B-5	3	1,066
Hendricks-B, 35, B-5	3	884
Hendricks-C, 35, B-5	1	35
Hendricks-H, 33, 26	1	2,031
Hendricks-I, 47, 26	1	1,260
Prairie Oil & Gas Co.:		
Hendricks, 40, 26	6	3,274
Cowden, 3, B-12	3	2,030
Pure Oil Co.:		
Hendricks-A, 41, B-5	10	2,595
Hendricks-B, 34, B-5	13	5,089
Hendricks-C, 45, 6	14	12,389
Republic Prod. Co.:		
Hendricks-A, 45, 26	6	2,472
Hendricks-B, 41, B-5	5	1,500
Hendricks-C, 42, B-5	5	355
Shell Pet. Corp.:		
Hendricks-A, 45, 26	6	833
Hendricks-B, 29, B-5	5	1,428
Hendricks-C, 29, B-5	8	2,916
Hendricks-D, 41, B-5	6	1,028
Hendricks-E, 49, B-5	4	1,064
Hendricks-F, 46, 26	7	2,560
Hendricks-G, 39, 26	1	93
Shell-Texas Co.:		
Cowden-A, 3, B-12	6	2,193
Hendricks, 45, 26	6	2,333
Hendricks-A, 29, B-5	10	3,636
Hendricks-B, 40, 26	6	1,683
Hendricks-C, 40, 26	6	2,887
Hendricks-D, 40, 26	6	1,152
Hendricks-E, 40, 26	4	956
Skelly Oil Co.:		
Hendricks, 40, 26	12	9,856
Hendricks-B, 39, 26	2	30
Southern Crude O. P. Co.:		
T-67 Hendricks-A, 42, B-5	3	232
T-67 Hendricks-3-A, 4, B-12	4	725
T-67 Hendricks-B, 44, 26	5	852
T-67 Hendricks-3-B, 33, 26	4	662
T-67 Hendricks-C, 33, B-5	5	936
T-67 Hendricks-2-D, 28, 26	3	948
T-67 Hendricks-E, 42, B-5	4	139
T-67 Hendricks-F, 33, B-5	4	712
T-68 Hendricks-3-A, 33, B-5	4	362
T-68 Hendricks-B, 46, 26	1	204
T-88 Hendricks-A, 44, 26	6	1,064
T-88 Hendricks-B, 4, B-12	3	1,384
T-88 Hendricks-C, 29, B-5	7	1,600
T-88 Hendricks-D, 4, B-12	2	4,700
T-88 Hendricks-H, 28, B-5	2	900
T-88 Hendricks-I, 30, B-5	7	1,562
T-88 Hendricks-J, 30, B-5	5	1,340
T-88 Hendricks-K, 41, 26	4	1,336
T-88 Hendricks-L, 4, B-12	2	662
T-88 Hendricks-M, 33, 26	29	11,300
T-88 Hendricks-N, 28, 26	4	1,062
T-88 Hendricks-O, 28, 26	1	277
T-88 Hendricks-P, 28, 26	1	330
T-88 Hendricks-Q, 27, 26	1	450
T-88 Hendricks-R, 27, 26	2	554
T-88 Hendricks-S, 34, 26	3	1,320
T-88 Hendricks-T, 34, 26	5	885
T-88 Hendricks-U, 41, 26	7	1,560
T-88 Hendricks-V, 29, 26	1	142
T-88 Hendricks-W, 5, B-12	1	1,124
T-89 Hendricks-A, 35, B-5	3	280
T-89 Hendricks-B, 35, B-5	2	374
T-89 Hendricks-C, 35, B-5	1	384
T-89 Hendricks-E, 40, B-5	2	off
T-89 Hendricks-F, 40, B-5	1	133
T-89 Hendricks-H, 46, 26	1	54
T-90 Hutchings, 47, 26	1	220
T-264 Hendricks, 5, B-12	1	off
Texon Oil & Land Co.:		
Hendricks-A, 41, B-5	6	984
Hendricks-B, 45, B-5	5	1,080
Winkler O. P. Co.:		
Hendricks, 33, 26	1	138
Total Hendricks Pool	496	166,566
Leck Area		
Atlantic-Kesslar & Logan:		
Leck, 3, 74	2	935
Amerada Pet. Corp.:		
Leck, 3, 74	1	384
Empire Gas & Fuel Co.:		
Daugherty, 3, 74	1	467
Magnolia Pet. Corp.:		
Scarborough, 1, C-22	1	56
Shell Pet. Corp.:		
Scarborough, 1, C-22	2	129
Total Leck area	7	1,091
O'Brien Pool		
Wentz Oil Corp.:		
Tobe Morton, 10, B-12	1	291
Richardson et al:		
Stockton, 50, F	1	317
Total O'Brien Pool	2	608
Grand total Winkler County	505	169,067

PECOS COUNTY
Week Ended January 19
Yates Pool

Company and lease—	Wells	Bbls.
California Co.:		
Yates, Lease 1	17	6,669
Smith, Lease 1, Sec. 27	3	297
Smith, Lease 1, Sec. 23	6	709
Smith, Lease 2	2	146
Smith, Lease 3	12	1,520
Tippett, Lease 1	1	40
Cosby Drlg. Co.:		
M. A. Smith	1	371
Gulf Prod. Co.:		
All leases	32	10,000
Humble Oil & Ref.:		
M. A. Smith	10	1,172
Smith-B	5	651
Kirby Pet. Co.:		
J. H. Tippett	1	71
Kirby Pet. & Edson:		
Tippett	1	203
Marland Oil Co.:		
Yates-A	9	1,160
Matador Oil Co.:		
Smith	2	481
Mazda & Savoy:		
Smith	2	460
McMan Oil & Gas Co.:		
Smith-A	1	665
Smith-B	4	1,353
Smith-C	4	466
Tippett	3	275
McMan & Marland:		
Yates	17	2,784
Mid-Kansas & Transcontinental:		
Yates-A	24	10,344
Yates-B	24	4,350
Yates-C	16	3,980
Yates-D	6	5,721
Yates-E	1	115
Yates-F	4	575
Yates-G	4	824
Yates-H	7	5,520
Smith	2	1,840
Smith-Taylor	18	2,275
Oil Operators Trust:		
Pecos River	7	700
Pecos Valley Oil Co.:		
Fee, Sec. 22, Blk. 16	1	100
Phillips Pet. Co.:		
Smith	1	80
Red Bank Oil Co.:		
Smith	5	800
Shell Pet. Co.:		
Tippett	11	2,021
Smith	9	916
Smith-B	1	700
Smith-D	3	450
Smith-E	1	35
Simms Oil Co.:		
Smith	7	4,412
Skelly Oil Co.:		
Tippett	1	101
Texon Oil & Land Co.:		
Yates	2	8
Grand total Yates Field	284	74,136

ECONOMIC PHASE OF ANTIKNOCK FUELS

(Continued from Page 32)

ing carbon. With this assumption the curves in Figure 3 have been drawn, various charges for carbon removal being plotted. It will be noted that the curves rise quickly with increased mileage and tend to approach a constant value. The saving is best represented in cents per mile.

For comparison with fuel costs it is necessary to reduce the fuel cost to the same basis as that for carbon removal. Table 3 gives the miles per gallon for various compression-ratios corresponding to mileages of 15 to 20, at a 5-to-1 compression-ratio. Table 4 is based upon 15 miles per gallon at a 5-to-1 compression-

ratio and gives the cost of fuel in cents per mile for fuel costs of 15, 20, 25 and 30 cents per gallon.

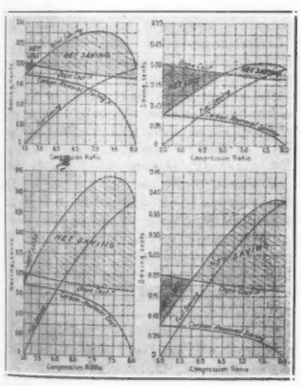
Plotting the fuel saving as found in Table 4, the carbon-removal saving as obtained from Figure 3, and a third curve representing the summation of these two, gives the total saving. Plotting the dope cost on the same diagram, a comparison can be made between dope cost and total savings. This has been done in Figure 4 for 15-cent gasoline and in Figure 5 for 30-cent gasoline. For both of these fuel costs a considerable net saving is shown due to the use of doped fuel and high compression for all ratios except those below 5.25-to-1.

The shape of the carbon-removal-saving curve is based upon an assumption that, with an 8-to-1 compression-ratio and doped fuel, it would be necessary to remove carbon as often as with a 5-to-1 compression-ratio and standard fuel. In other words, only a given strength of doped fuel is considered, and the higher the compression-ratio is, the less is the mileage before carbon removal becomes necessary. Also, a straight-line relationship is used for compression-ratio and extra miles before carbon removal, the extra mileage for various compression-ratios being: for 5 to 1, 30,000 miles; for 6 to 1, 20,000 miles; for 7 to 1, 10,000 miles; and for 8 to 1, none.

Figures 6 and 7 are based upon the same data as Figures 4 and 5, respectively, with the exception of the cost of carbon removal. For Figures 6 and 7 the cost is based upon 10,000 miles per carbon removal for an 8-to-1 compression-ratio with doped fuel, and 40,000 miles per carbon removal for a 5-to-1 compression-ratio, also using doped fuel.

For low fuel cost, Figure 6 indicates no saving until a compression-ratio of 6.5 to 1 is reached. For the higher fuel cost, 30 cents per gallon, Figure 7 indicates considerable saving when compressions above 5.75 to 1 are used.

While the foregoing part of this analysis refers particularly to the use of doped fuels, it applies also to specially prepared fuels of high antiknock value. In this case the dope cost is analogous to the difference in cost between the so-called standard fuels and the specially prepared antiknock fuels. This method of analysis, applied with actual costs and performance data, should indicate to the refiners the economic value of a specially prepared fuel which it is proposed to market.



Net Savings Resulting from High Compression and Antiknock Fuels

Figure 4 (upper left) is based on gasoline at 15 cents per gallon plus 3 cents for dope, a gasoline consumption of 15 miles per gallon, and an expense of $10 for removal of carbon.

Figure 5 (lower left) is based on gasoline at 30 cents per gallon plus 3 cents for dope, a gasoline consumption of 15 miles per gallon, and an expense of $10 for removal of carbon.

Effect of High Compression with Low Carbon-Expense

Figures 6 (upper right) and 7 (lower right) are based on the same data as Figures 4 and 5 except for carbon removal, which is on a basis of 10,000 miles with 5-to-1 compression-ratio and no dope fuel, and other mileages as indicated in the text.

Engine Performance

The third factor to be considered is that of performance. When high compression is substituted for lower compression, the power per cubic inch of displacement is increased. If no change in gear ratio is made, the horespower-speed curve is raised and improved acceleration is obtained. In Figure 8, AB represents the car resistance, BC the reserve power for acceleration at that speed, and CD the gain in reserve power for acceleration due to high compression. The relation between CD and AC, or the percentage of gain in power resulting from various compression-ratios higher than 5 to 1, based on Goodenough and Baker's curve, Figure 1, is as follows: 5.50-to-1 ratio, 4.7 per cent; 6.0-to-1, 8.9; 6.5-to-1, 13.1; 7.0-to-1, 17.0; 7.5-to-1, 20.6; and 8.0-to-1 ratio, 23.9 per cent.

Thus the manufacturer can produce a car having greater power and better performance with very little redesigning and almost no retooling of his plant by increasing the compression-ratio of the engine. Gains in economy, as indicated earlier in this paper, will be obtained also with full-load conditions, although these probably are of secondary importance to the manufacturer.

Actually, an automobile is operated only a very small part of the time under full-load conditions, and it is of interest to notice how the economy is affected under what may be termed level-road conditions. In Figure 8 the curve marked Level Road Horsepower represents the power required on the level road at various speeds. This is the power the engine must develop to maintain constant speed, and consequently the engine will be operating under part-throttle conditions except at the maximum car-speed. It is obvious that the throttle opening will be less for the high-compression engine than for the low-compression engine when developing the power required for level-road conditions. The ratio of AB to AC is greater than that of AB to AD. The effect of smaller throttle-opening on the high-compression engine for level-road conditions is to reduce the economy.

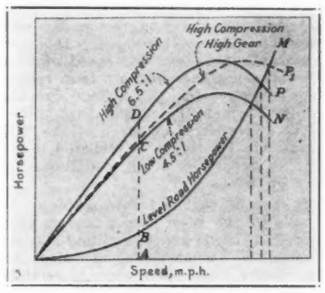


Fig. 8—Typical Engine-Performance Curves

The gear reduction represented in the broken-line high compression high gear curve is 17 per cent less than that represented in the full line high compression 6.5: 1 curve.

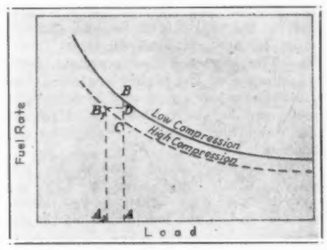


Fig. 9—Fuel Rates at Constant Speed

Typical fuel-rate curves for both a low and a high-compression engine at a given speed are shown in Figure 9. Since the high-compression engine must be operated at less load for a given speed, it can be seen that at these lower loads there is less gain from high compression than might be expected. Thus, fuel rate A_1B_1 would be obtained with the high-compression engine rather than the expected rate AC, and the actual gain in economy might be considerably less than would be expected from an analysis based upon full-load operation.

The expected fuel economy at level-road conditions can be obtained, however, by using a higher gear-ratio. This results in shifting the curve marked High Compression 6.5: 1 in Figure 8, to the right as shown in the curve marked High Compression High Gear, making it coincide partly with the curve marked Low Compression 4.5: 1. The coincidence will be at the lower speeds and the result will be as follows:

1. High-compression economy up to approximately one-half the maximum speed.
2. Approximately the same performance as with a low-compression engine up to half speed.
3. Greater acceleration from half speed to maximum speed.
4. An increase in maximum speed.
5. Slower engine-speed for a given car-speed.

If it were possible to place some measure of value on the added performance resulting from high compression, which is obtained with little or no added expense in construction, this value could be added to the curves for total saving shown in Figures 4 to 7, increasing the net saving and decreasing the net loss shown in these illustrations. This performance factor is valued very highly by both manufacturer and owner, and in many cases the owner will consider that the added performance alone justified the cost of special fuel.

While many of the assumptions in this analysis may be somewhat far-fetched, a study such as this leads to the following conclusions:

1. The carbon-removal saving resulting from the use of a fixed doped fuel is highest for the lowest compression-ratio, and vice versa.
2. The fuel saving has a definite relationship with compression-ratio and is directly proportional to the cost of fuel for any compression-ratio.
3. For a given dope, the carbon-removal saving will be principally a fixed item, which will vary only with the cost of removing the carbon.
4. With low fuel-costs no saving seems to result from the use of doped fuels with the present compression-ratios.
5. With higher fuel-costs the net saving becomes considerable. For 30-cent gasoline and the other conditions as chosen, a net saving of more than 150 per cent of the dope cost is shown for compression-ratios varying between 6.8 and 7.8 to 1.
6. Whether the use of doped fuel is economical at a compression-ratio of 5 to 1 depends entirely upon carbon-removal

BRECKENRIDGE OIL PIONEER DEAD; REMARKABLE CAREER OF B. S. WALKER

Many stories have been written about Texas oil fields, but none more striking than elements in the life of Breckenridge Stephens Walker, multimillionaire, who died at his home in Fort Worth last week.

His first name came from a town that oil raised from a population of a bare 1,000 in 1917 to more than 20,000 two years later.

His middle name came from the county in which several famous oil towns sprang into centers of bustling activity, where sleds carried passengers at 25 cents a head across streets waist-deep in mud and where ham and eggs rose in price to equal that of a cot in an ex-army tent.

Mr. Walker died at the age of 52. He was the first child born after the county was organized, and though he was a son of the first county judge, his early youth was about as penniless as that of other children in the county. It was a county where no records were hung up in agricultural production and where most of the land was grazed by cattle.

His first business venture was with his brother in conducting a wagon yard and carrying government mail to Ranger, in the next county south. His first job was a freighter at 50 cents a day.

From the wagon yard he and his brother graduated to the hardware business, and "Breck" bought out his brother and added a stock of general merchandise. Oil was a long way off, but the store prospered and in 1911 he and C. M. Caldwell became associated in a partnership that later became one of the outstanding organizations in the oil development of Stephens County.

Mr. Walker's sudden rise to the rank of millionaire was not the result only of the chance discovery of oil. For years he had been confident of the future of Stephens County, and particularly of the oil possibilities. He had acquired as much land and leases as his resources permitted, and when the discovery well was brought in on the outskirts of Breckenridge he owned 3,500 acres in fee close to the town. At the time of his death and for many years previous he was the largest holder of oil royalties in Stephens County.

He served three years as mayor of Breckenridge. "Breck" Walker shared his good fortune with the town and county whose names he bore. He maintained a home in Breckenridge, the equal of his handsome home in Fort Worth, and the needs of his birthplace had first consideration.

Breckenridge, at the time of the discovery of oil, had a population of 1,000 and was without a railroad. By 1920 it had a population of 20,000 and through the activity and generosity, with time and money, of Walker and a few other similarly civic-minded citizens, it was tided over the perils that followed boom days. Before the first railroad reached Breckenridge, Walker had erected a $300,000 building for the bank of which he was president.

Breckenridge S. Walker

When the existence of Breckenridge was threatened in 1921 because of a lack of water supply, Walker and Caldwell built a waterworks system at a cost of $100,000.

Mr. Walker was largely instrumental in the building of three railroads into his home town. All came after the discovery of oil in 1917. They were the Wichita Falls & Southern, the Fort Worth & Ranger and the Cisco & Northeastern, the latter recently purchased by the Texas & Pacific Railroad.

When the lean years came to the oil belt as a reaction from the boom, Mr. Walker put $400,000 of his private funds at the disposal of the bank he headed. Two banking institutions of Breckenridge had closed their doors and Mr. Walker volunteered to lend to depositors of the two banks, with accounts of $50 and less, the full amount of their accounts.

Walker was one of the organizers of the Walker-Caldwell Producing Co. of Breckenridge, which held extensive oil interests. He was chairman of the board of directors of the Landreth Oil Corp.

saving, a low cost of carbon removal and long mileage before removing carbon making the use of doped fuel uneconomical, and vice versa.

7. Under actual operating conditions at the lower speeds the fuel economy resulting from higher compression with the existing gear-ratio will be less than expected from a full-load analysis.

8. The expected fuel economy, better performance at the higher speeds, a higher maximum car-speed and lower engine-speeds can be obtained by decreasing the gear reduction when decreasing the compression.

Still another point should be mentioned. While this country has been warned time and again of a possible shortage and of the exhaustion of the supply of petroleum, the story of one period of overproduction after another may give the impression that we have an inexhaustible supply of this natural resource. Eventually, however, we shall approach a period of shortage and probable exhaustion of petroleum fuel. The use of high-compression engines will delay the arrival of this time. Even though there may be a question as to any net saving to the consumer, high compression should be considered desirable as a means of conserving our natural resources.

FORM PETROLEUM EXPORT ASSOCIATION

(Continued from Page 31)

achieve added economies in the foreign operations of the companies involved, a secondardy factor was the desire of the companies involved to present a stronger front to the competition offered by the Russian petroleum trust.

Russian Competition

Standard Oil Co. (New Jersey) has previously been allied with Royal Dutch-Shell in the latter's attitude toward the Russian syndicate, both of these interests being claimants against the Russian government for compensation for properties seized during the nationalization of the Russian oil industry. The American export petroleum association will be called upon to meet Russian competition in marketing refined products in many sections of the country, and the trade is interested in watching just what type of competition will develop. In its operations in Great Britain, the Soviet Naphtha Syndicate has adopted destructive price cutting tactics and has succeeded in putting the gasoline business in Great Britain in an unprofitable position for all interests involved. It is not believed possible, however, that Russia has either the oil or the economic resources to develop this marketing plan on a world wide scale.

Actual operation of the export petroleum association will probably have an important bearing upon the ocean charter market. At present, there is apparently a marked oversupply of ocean tankers, and prevailing charter rates are the lowest since the war. When the marketing plans of the sponsors of the export association get under way, the demand for ocean tonnage is expected to dwindle still further, in that many of the long hauls which have previously been necessary will be eliminated by the functioning of the export group's scheme of placing orders in the markets nearest to point of destination. In this connection, an interesting point is raised regarding the manner in which the export corporation is to move its refined products abroad. In some quarters, it is believed that ocean tankage owned by the principal companies will be largely utilized on a charter basis, while it has also been suggested that the export corporation may acquire some tonnage of its own.

ADD GASOLINE DISTRIBUTION

CHICAGO, Jan. 19.—The Commerce Petroleum Co., large fuel oil distributors of this city, has incorporated the Gasoline Corp., with 200 shares of no par value stock, to act as a subsidiary for the distribution of gasoline. Plans are not ready for announcement in detail. L. E. Schurman is president of the company.

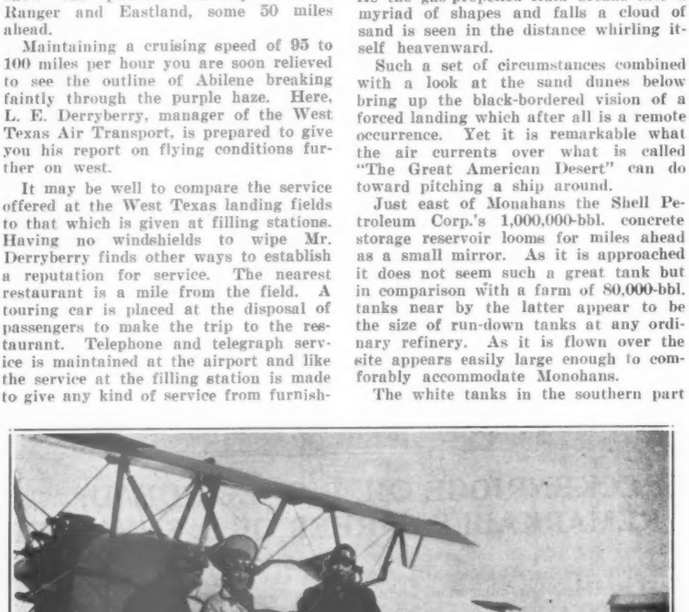
OIL REPORTER SEES WEST TEXAS FROM SKY

(Continued from Page 31)

personal pronoun under such circumstances) he returns the map logged to show the position halfway between Ranger and Eastland, some 50 miles ahead.

Maintaining a cruising speed of 95 to 100 miles per hour you are soon relieved to see the outline of Abilene breaking faintly through the purple haze. Here, L. E. Derryberry, manager of the West Texas Air Transport, is prepared to give you his report on flying conditions further on west.

It may be well to compare the service offered at the West Texas landing fields to that which is given at filling stations. Having no windshields to wipe Mr. Derryberry finds other ways to establish a reputation for service. The nearest restaurant is a mile from the field. A touring car is placed at the disposal of passengers to make the trip to the restaurant. Telephone and telegraph service is maintained at the airport and like the service at the filling station is made to give any kind of service from furnishing drinking water to supplying safety pins.



Left to right, the pilot, Currie Saunders, the writer, and F. W. Burford, president of the Burford Oil Co.

Leaving Abilene the plane sweeps into the eastern part of West Texas proper. This rapidly developing section of the State unfolds itself as one of the most interesting parts of the flight. Interested primarily in refining, Mr. Burford had charted the course of the ship to fly over the plants under construction along the route.

Swinging southwest from the Westbrook Field, the oldest in West Texas, the derricks in the Chalk and Roberts areas in southern Howard County, one of the most active sectors in West Texas, appeared dimly on the distant horizon. Banking sharply, Currie Saunders, the pilot, headed the plane to Big Spring.

On the eastern outskirts of the city two refineries are under construction. Circling low a fairly accurate estimate of the completed work is obtained. And in the same manner the progress of tank building programs is obtained.

Cattle Are Educated

Heading on west to Midland an idea of how much flying is done in West Texas is gained. Even the herds on the range ignore the roaring noise overhead. So far as the writer knows there is only one member of the bovine family in West Texas that is not "air minded." One lone member of a herd near Pecos City broke ranks and raised a sand storm when the plane swooped low. Planes seem to be so common in that section that farmers plowing sections of land with modern machinery give only a passing glance.

Leaving Midland, interest is centered around the development in contigious territory as the result of Winkler County discoveries. A heading well heralded the awe inspiring Hendricks Pool.

With the field between a sinking sun and the plane a well making a mighty head, hurling a grotesque-shaped cloud of oil in the air, is an awesome picture. As the gas-propelled fluid breaks into a myriad of shapes and falls a cloud of sand is seen in the distance whirling itself heavenward.

Such a set of circumstances combined with a look at the sand dunes below bring up the black-bordered vision of a forced landing which after all is a remote occurrence. Yet it is remarkable what the air currents over what is called "The Great American Desert" can do toward pitching a ship around.

Just east of Monahans the Shell Petroleum Corp.'s 1,000,000-bbl. concrete storage reservoir looms for miles ahead as a small mirror. As it is approached it does not seem such a great tank but in comparison with a farm of 80,000-bbl. tanks near by the latter appear to be the size of run-down tanks at any ordinary refinery. As it is flown over the site appears easily large enough to comforably accommodate Monohans.

The white tanks in the southern part looming against a blank and purple hazy background keeps one bobbing around unmindful of the sand dunes below for fear of missing some of the spectacle the Hendricks Pool offers in that otherwise barren sector.

Pipe line routes of the short systems running from Hendricks to Ward County loading racks are not distinguished as are the routes of other lines out of West Texas in other sections. The latter can be traced for miles as a freshly excavated long straight narrow line. The shifting sands cover the routes of those from Hendricks but some can be discerned by the poles for communication systems.

Some of those roads through the sand seem as if they still could deal plenty of misery to an automobile driver. A railroad project tapping the pool is nearing completion and from the air seems to have found the only solid ground in the whole country.

Hendricks a Great Site

Hendricks with its hundreds of derricks, batteries of tanks, treating plants, pump stations and lease houses is truly the greatest thing outdoors. Its miles of derricks graduate down to a black spot on the horizon when looking from one end of the field to the other.

Crowded for time the pilot was forced to swing on westward to reach Pecos City before nightfall. In the dusk the tanks at the Burford Oil Co.'s Pecos refinery with their red lead coats stood out prominently. For a while it appeared there was no place to land in Pecos.

Currie spotted a clearing in the mesquite-covered plain and dived to what proved to be one of the best landing fields in West Texas. Pecos civic bodies are constantly improving the field and by summer expect to have a first-class airport.

Taking off the following day a 40-mile head wind not only reduced cruising speed but placed the novice of the party in a direful dilemma. This particular ship seemed to be sired by the wildest mustang of the western plains and was perfectly in its element bucking and plunging but steadily making its way forward. A little of that plays havoc in many respects. A rebellious breakfast developed into a severe attack of air sickness.

After a while such nauseating attacks disappeared, although more reluctantly than they strike, and with a glassy stare the horrors of a rugged country below are again speculated upon. Currie sent the ship to high altitudes. Those climbs did not get us out of the bumps and only sent us to a higher altitude to drop from. Down low it was the same. Therefore the only thing remaining was to fly on occasionally dipping down to "high ball" an engineer driving a creeping oil train.

A bumpy flying day means little to Currie, who, incidentally, is well known in Louisiana. He is associated with Clem Clark in a drilling contracting firm. A few bumps means nothing to Currie and he calmly explains that a forced landing is easier on a windy day than on a calm day.

After racing a rain storm for about 100 miles Currie set his ship down in a 40-acre field and let the storm blow over before proceeding on a return trip. Taking off again more rainy weather was encountered and by the time the ship arrived at Love Field in Dallas it was dark and water covered the field. To the amazement of the few onlookers he made a neat landing and sent up a fine spray as the plane's wheels ripped through the water.

Just as an example of the irony of fate and to show that after all that the air is the safest place to travel take the experience of Currie and Mr. Burford that night. Mr. Burford had 30 minutes to catch a train. He stopped a youth driving an old model car sans brakes and offered the boy a couple of dollars to get him to the station in 15 minutes.

His trip was so perilous that the youngster was paid to slow down and quit dodging other cars and vehicles. Currie's trip to a downtown hotel was even more eventful. After caring for all details at the field he boarded a bus for the business section. The bus traveled a few blocks and toppled over, but without injury to any of the passengers.

So, after all, if something can be done to eliminate panic on the part of novices and improve the plumbing of planes, cross-country flying to West Texas will be as common as making the trip via train or automobile.

PANHANDLE FIELDS

(Continued from Page 39)

abandoned at 360 feet. The Texas Company's No. 17 Hatchett was dry and abandoned at 397 feet. Webb's No. 1 Maltby was dry and abandoned at 480 feet.

Coleman County

Roth & Faurot's No. 2 Terry was dry and abandoned at 2,205 feet. American Maracaibo Co.'s No. 1 Anson was dry and abandoned at 3,015 feet. Cunningham and others' No. 13-A Jennings made 74 bbls. after having been shot with 5 quarts twice at 1,131-56 feet.

Eastland County

Hockok Production Co.'s No. 2 Amis was drilled deeper from 3,208 feet to 3,378 feet and was shot with 95 quarts at 3,311-78 feet and swabbed 100 bbls.

Erath County

Snebold & White's No. 1 Smith made 17,000,000 feet of gas at 3,237-39 feet. 1,400 pounds rock pressure.

McCulloch County

McLean & Jamison's No. 3 West was dry and abandoned at 1,020 feet.

Shackelford County

Big State Oil Co.'s No. 1 Jeter was dry and abandoned at 1,308 feet. Ear & Dunn's No. 3 Matthews made 603 bbls.

at 1,126-44 feet. Roeser & Pendleton's No. 5-A-83 Cook made 100 bbls. at 1,370-80 feet. Tennent and others' No. 1 Matthews was dry and abandoned at 1,260 feet.

Stephens County

Pace & Ward and others' No. 1 Dixon was dry and abandoned at 2,185 feet. Texas Pacific Coal & Oil Co.'s No. 12 Veale was shot with 30 quarts at 3,122-42 feet and made 2 bbls. of oil and 200,000 feet of gas.

Palo Pinto County

Nelson Oil Syndicate's No. 1 Harbin was temporarily abandoned at 814 feet.

PANHANDLE COMPLETIONS

Gray County

Magnolia Petroleum Co.'s No. 1 G. H. Saunders, located 330 feet from SE W half NW, Section 4, Block 1, A.C.H.&B. Survey, was shot with 60 quarts at 2,807-20 feet and made 103 bbls. This well encountered the granite wash pay at 2,697-2,706 feet and was drilled to a total depth of 2,820 feet. Pure Oil Co.'s No. 8 Davis, located 330 feet from NW NE, Section 86, Block 3, I.&G.N.R.R. Survey, made 120 bbls. at 3,239-44 feet and was drilled to a total depth of 3,282 feet. Its No. 9 Davis made 230 bbls. at 3,098-3,114 feet and 3,110-19 feet. Wilcox Pampa Oil Co.'s No. 30 Worley Reynolds was shot with 60 quarts at 3,024-90 feet and made 150 bbls. after having been drilled to a total depth of 3,105 feet. Gulf Production Co.'s No. 6 Bowers, located 330 feet south and east of NW cor. W half, Section 89, Block B-2, H.&G.N.R.R. Survey, made 1,460 bbls. at 3,055 feet.

Hutchinson County

Phillips Petroleum Corp.'s No. 11 Whitenburg, located in Section 63, Block 46, H.&T.C.R.R. Survey, was shot with 60 quarts at 2,855-66 feet and made a 60-bbl. well. Timms and others' No. 2 Garner, located 990 feet south and 330 feet east of northwest corner of J. W. Proctor Survey, was shot with 150 quarts at 3,045-90 feet and made 125 bbls.

Moore County

Phillips Pet. Corp.'s No. 3 J. T. Sneed, Jr. (James), located 600 feet south and 330 feet west of northwest corner of J. W. Proctor Survey, swabbed 785 bbls. after having been shot with 10 quarts at 3,126-30 feet.

GASOLINE PRICES ARE STEADY IN OKLAHOMA

(Continued from Page 28)

of February. This accounts for the firmness apparent during the past 10 days in the Oklahoma market.

Another favorable development of the past week was the advance in gasoline export prices at the Gulf Coast. This is of direct importance due to the fact that the export contracts previously mentioned are based on these prices, the refiners obtaining 2 cents a gallon under the Gulf price. These export prices were advanced three-eighths cent during the past week. This meant an advance to 8 cents f.o.b. North Texas for the 375 endpoint grade and 7.75 cents for the 390 endpoint grade.

Gasolines and Naphthas

Most of the larger refiners in Oklahoma continued to maintain an 8-cent price on U. S. Motor gasoline to the jobbing trade. This was a top price and prices ranged down to 7¼ cents. Some West Texas gasoline sold under 7 cents basis Group 3. Following are weighted average prices based on reports on sales to jobbers by representative refiners in Oklahoma: 58-60, U. S. Motor gasoline, 7.96 cents; 60-62 437 endpoint, 8.47 cents; 60-62 400 endpoint, 8.437 cents; and 64-66 375, 9.37 cents.

U. S. Motor Weak

The domestic movement of the higher gravity gasolines was fair during the week some complaints being expressed by refiners regarding the competition of Arkansas and North Louisiana refiners. The export movement previously explained has brought a feeling of security among refiners regarding the high gravity gasolines which does not extend to the 58-60 U. S. Motor grade. Although prices have been firm on that grade during the past two weeks, the sellers are not so sure about the future. Jobbers apparently are looking for lower prices and are only buying to cover their immediate requirements and every effort is being made to secure additional price concessions. Many in the trade feel that a 1 to 2-cent reduction in gasoline tank wagon and service station prices in the Standard of Indiana territory is assured before the end of the month in line with the adjustments in the retail market already made in the eastern states. A reduction at this time unquestionably would be reflected in the Mid-Continent refinery market.

Kerosene and Distillates

The 41-43 water white gasoline in Oklahoma was steady at a price range of 5¼ to 5½ cents during the week. The 42-44 grade was scarce at 6 cents to the trade. With North Texas eliminated for 20 to 30 days the price weakness of early January was no longer apparent.

There were no new developments in distillates. The Oklahoma refiner who has a low cold test product with low flash and good color and odor is not having any difficulty in moving his plant output. In the Middle West one large refiner who was offering distillates during the late fall and early winter months is said to have withdrawn from the spot market. The contract movement of this company is said to take care of the output from its three refineries.

Fuel Oils and Gas Oils

Since the first of the year many of the Oklahoma refiners have closed contracts with railroads extending through 1929. There has been considerable difference of opinion between buyers and sellers regarding these contracts and compromises have been necessary.

One contract has a 72½-cent minimum price with a 92½-cent maximum, the price to change with 60 per cent of the posted price for 36 degrees gravity crude oil, the first 25-cent advance in crude oil not to affect the contract price. Another contract has a 70-cent minimum and a 90-cent maximum with changes based on 60 per cent of the posted schedule for 36 degrees gravity crude oil without the 25-cent provision. Another contract starts with a base price of 70 cents with changes based on 60 per cent of the crude oil change without any provision as to maximum and minimum prices. A modification of this contract gives the seller a 70-cent minimum protection.

The spot market in fuel oil is unchanged. The high cold test fuels are a drug on the market and many refiners are storing and will make no attempt to sell on a market which demands low cold test products. Gas oils were unchanged during the week.

Lubricating Oils and Wax

The reduction in neutral oil prices was not a surprise to the trade. The movement from Oklahoma has been slow for several weeks. Reductions on the several grades vary from one-quarter to 1½ cents. No price change was made in the 200, 3 color neutral oil which is one of the principal grades manufactured in Oklahoma and for which there is usually a strong demand. The largest decreases were in the 4 and 5 color grades.

Steam refined cylinder stocks and bright stocks are now quoted over a wide range. Some refiners have advanced their prices while other have made no changes since early in January.

Wax prices are one-quarter cent lower. Both the domestic and export market was inactive during the week.

CHECKUP SHOWS ACCURACY OF NEW AERIAL MAPS OF GULF COAST AREA

The Texas Company and some other Gulf Coast companies recently completed making entirely new ownership and detail maps of the Boling Dome area in Wharton and Fort Bend Counties. The maps were drawn from aerial photographs of the district taken by Edgar Tobin of San Antonio, Tex.

The photographs were taken as an experiment for Coastal companies in aerial map making when it was found that old maps drawn from survey records were not accurate. According to the companies having the maps made, the experiment at Boling proved successful for all practical purposes and a check with land surveys and the owners of the land showed that the aerial maps were in error less than 1 per cent.

The aerial photograph was made with a base map, on which had been charted according to survey a river and certain roads as guides. In the finished picture, which was made in less than a day's flying time, more than 75 per cent of the ownership lines showed so distinctly that they could be traced on the base map. The few remaining ownership lines, which were indistinguishable because of large wooded tracts or undivided, uncultivated tracts, were determined readily by interviews with the owners.

Aerial picture of Boling Field and area (Gulf Coast) from which oil companies redrew and corrected previous ownership maps. Small white blurs at various places are shadows of derricks.

PAPERS INDICATE GOOD MEETING OF ENGINEERS

DALLAS, Tex., Jan. 22.—Interesting papers appear on the preliminary program arranged for the spring meeting of the Texas-Louisiana-Arkansas district of the A.P.I. Division of Development and Production Engineering to be held in the Baker Hotel here April 3 and 4. The subjects include: "Penalty of Crooked Holes," "Overcoming Crooked Holes," "Oil Well Cementing Problems," "Maintaining Pressure and Repressuring During Early Stage of Development," "Effect of Choking Wells in Winkler Pools," "Value and Importance of Accurate Field Records."

District chairman, vice chairman and secretary for the ensuing year are to be chosen at the forenoon session of the second day. W. D. Brookover, Wichita Falls, Tex., is chairman of the nominating committee.

The report of the special committee on Winkler County Pumping Equipment, Joseph Holmes chairman, will be presented and discussed. The special committee on Standardization of Screen Pipe Openings, M. Manning chairman, has made one report, which was referred to the A.P.I. Committee on Standardization of Pumping Equipment. The A.P.I. committee referred additional questions back to Mr. Manning's committee and these will be reported on at the Dallas meeting.

Reports will be received from standing district committees on Drilling Practice and on Production Practice.

The Dallas Wildcat Committee of the Mid-Continent Oil and Gas Association is in charge of arrangements for entertainment.

PIONEER OIL OPERATOR DEAD

WASHINGTON, Pa., Jan. 21.—David McKain, pioneer oil and gas operator, died in his home here January 11. Mr. McKain, who was born in Philadelphia, Pa., in 1844, went to the Butler district of this State when the oil excitement developed there and became a drilling contractor. Later he operated in the Bradford, Washington (Pa.) and West Virginia Fields. He was one of the first drilling contractors to use natural gas as a fuel. Mr. McKain was a member of Masonic orders and was a Shriner. He leaves one son and one daughter.

Transportation of Oil In Pipe Lines Topic Of A.S.M.E. Meeting

The annual oil transportation meeting of the Mid-Continent section of the American Society of Mechanical Engineers was held in Tulsa, on Friday, January 18, 1929.

A paper entitled "Economics of Electric Pipe Line Pumping," by J. B. Thomas, engineer for the Texas Power & Light Co., Dallas, Tex., was the principal feature of the meeting which was exceptionally well attended.

The paper brought out the great importance of considering the load factor or at what per cent of the time the lines are to be run at full capacity in making computations regarding the various kinds of energy to be utilized for power. Another interesting feature of the paper was that it arbitrarily established a load factor of 65 per cent capacity as average under normal operating conditions in pumping oil.

According to many engineers who have considered this phase of oil pumping, the 65 per cent load factor named is rather too low for main trunk line operation, and too high for gathering lines.

Mr. Thomas' paper was adequately discussed by Floyd Waterhouse, mechanical engineer of the Oklahoma Pipe Line Co. of Muskogee, Okla., and also by B. P. Sibole of the Sinclair Pipe Line Co.

Joseph W. Hayes, efficiency engineer of the Cosden Pipe Line Co., presided in the absence of William G. Heltzel of the Sinclair Pipe Line Co., who is chairman of the section.

A. J. Kerr, secretary-treasurer of the section, read a report of William D. Moorer, the section's delegate to the annual New York convention of the American Society of Mechanical Engineers. Mr. Kerr also discussed various phases of the World Engineering Congress which will be held in Japan in the fall of 1929. This will be the first world congress of engineering ever held and is expected to evoke a wide interest. President-elect Herbert Hoover is to be the honorary chairman of the congress.

REFINERY WORKER DIES IN ATTEMPTED RESCUE

GREAT FALLS, Mont., Jan. 22.—Two men were killed by gas fumes at Shelby last week. Marvin Johnson, an oil worker at the Toole County refinery went into a tank to hold a bucking bar on a rivet at a leaking seam. Shortly after he had entered the tank the men outside heard him fall and when he failed to respond to their calls, a fellow worker, James Fox, volunteered to go into the tank after him.

Fox tied a piece of insulated wire around him in case he might need assistance and descended into the tank where he was seen to stoop over Johnson's body. Suddenly Fox fell forward on his face and the insulated piece of wire parted when the crew attempted to pull him out. No other volunteers attempted to go into the tank and a hole was cut through the plates on the side to reach the two men. The bodies were recovered through this hole. Johnson was 22 years old and Fox 54 years old.

MEXICAN PRODUCTION LOWER

Mexican crude oil production averaged 101,248 bbls. daily in week ended January 12, compared with 104,143 in preceding week. Light oil output averaged 45,000 bbls. a day, compared with 47,143 daily in previous week, while heavy oil production was 56,428 bbls. daily, against 57,000.

JAMES HEADS ROYALTY OWNERS

Wade H. James, president of the Independent Oil & Gas Co., was elected president of the Kansas-Oklahoma division of the Mid-Continent Royalty Owners' Association at its annual meeting held in Tulsa Monday. He succeeds Willard Foster, who was made chairman of the board.

TEXAS LAND LAWS EXPLAINED; VARIATIONS TRACED TO ORIGINS

By Guy R. Holcomb

Many lawyers who are not familiar with the origin of Texas land titles frequently inquire as to the source of the titles granted by Texas since no grant is shown from the United States Government. A Chicago lawyer recently wrote a well known Texas lawyer asking the question: "Where did Texas get its title to the land in question?" The Texas lawyer replied: "From the Indians, God Almighty and Sam Houston."

When Texas was admitted to the Union all of its lands were retained under the terms of the joint resolution of Congress admitting Texas to the United States. Hence, all land titles in Texas have their origin in the Sovereign Power, and anyone claiming title to lands in Texas must show a grant or purchase from such Sovereign Power.

When the white people came to explore Texas they found the Indians, just as in other states. Both France and Spain claimed Texas. Spain based her claim on the right of discovery by Columbus. Cortez conquered Mexico for Spain and Texas was claimed as part of Mexico.

From 1712 to 1803 Texas was ruled by both France and Spain. After France sold the Louisiana territory to the United States the United States gave up its claim to any part of Texas under the terms of the Florida acquisition. In 1821 Mexico won its freedom from Spain and Texas became a province of Mexico. On March 2, 1836, Texas declared itself free and independent of Mexico. On April 21, 1836, Sam Houston defeated the Mexican ruler, Santa Anna, and wrested Texas from the rule of Mexico. For 10 years after its victory over Mexico Texas was a Republic. In December, 1845, Texas was admitted to the United States as a state, and, as stated above, retained all its lands.

Texas seceded with the other southern states and became a State of the Confederacy. In 1870 it was readmitted to the Union. Thus, it will be seen that Texas has had six flags waved over its domain.

Different Sources of Titles

Titles in Texas are, therefore, deraigned through various sources—Spanish and Mexican grants, grants from the Republic of Texas, and different classes of titles from the State of Texas. Texas gave much of its land under certificates to railroads, homesteaders, war veterans and all land now owned by the State belongs to the public free school fund. These lands are acquired in several different ways. There is what is known as the unsurveyed school land act. One who discovers vacant land in Texas, under the terms of this act may file an application of inquiry with the Commissioner of the General Land Office and if the commissioner believes the land to be vacant school land he authorizes the applicant to have it surveyed and file field notes in the General Land Office, and if they are approved the commissioner classifies the land and values it; and upon application to purchase awards it to the applicant. This award covers the surface rights only. The purchaser acquires his right to the oil and gas under what is known as the "Relinquishment Act" which will be discussed later. For several years on account of litigation concerning state school lands there have been no sales of lands in Texas by the commissioner except sales of scrap school lands. But under the present law any purchaser of state school land acquires his right to the oil and gas under the "Relinquishment Act."

The Constitution of the State of Texas in 1876 releases to the owner or owners of the soil all mines and minerals that may be on the same, subject to taxation as other property. This provision of the Constitution has been held to apply to "owners" of lands at the date it became effective, only, April 18, 1876, and has no prospective operation. Since the Constitution was adopted and became effective the legislature has enacted the statute of 1895, containing the original language of the 1876 Constitution releasing mineral rights to owners of the soil, the effect of which statute was to release mineral rights in all lands granted prior to 1895. But by this statute minerals in lands thereafter granted were reserved to the State. Cox vs. Robison, Comr. 150 S. W. 1,149. Green vs. Robison, Comr. 210 S. W. 498, Supreme Court of Texas. Therefore, it will be seen that all mineral rights held by the State prior to 1895 have been released to the owners of the soil. All grants prior to 1895 to purchasers carry all mineral rights in the lands.

The act of 1895 reserved to the State all minerals in lands thereafter sold.

But in 1919 the Legislature of the State of Texas anacted as Chapter 81 what is commonly known as the "Relinquishment Act." The Relinquishment Act appears in the Revised Civil Statutes of 1925, a Art. 5,367 to 5,382, inc. The act relinquishes to the owner of the soil, as agent of the State, fifteen-sixteenths of the oil and gas, making the owner of the soil agent for the State in the sale or lease of such oil and gas, only. The act provides that the purchaser of the oil and gas shall pay to the owner of the soil "like amounts" that he shall pay to the State. That is, the owner who leases or sells the fifteen-sixteenths of the oil and gas must, in addition to the 10 cents per acre per year provided for in said act, pay to the State one-half of all bonuses received for the fifteen-sixteenths of the oil and gas. The State always has its one-sixteenth royalty.

This relinquishment has just been interpreted by the Supreme Court of Texas and has been held constitutional by such court. Therefore, with respect to sale of lands by the State of Texas at present it is the law of the land. Green vs. Robison, 8 S. W. 2nd 655.

Oil and Gas Permits on State Land

The act of the legislature of 1925 relating to oil and gas permits on state lands provides that the Commissioner of the General Land Office shall issue permits on state lands, other than university lands, on receipts of an application filed with the County Clerk, if the land is surveyed area, and with the County Surveyor, if the area be unsurveyed, in the county where the land is located, together with a $1 filing fee and 10 cents per acre, accompanied with an affidavit showing what other permits the applicant owns, in good standing. These permits are for a term of from two to three years, depending on certain development work and combination with other permits.

The present legislature has just enacted a law repealing all laws authorizing the commissioner to issue permits on university lands, and the law is now effective. No permits can now be secured on university lands, as there is no law authorizing them.

Permits may be secured on the beds of navigable streams and rivers in Texas, in the same manner as permits are secured on state school lands, and such permits run for a term of one year. Navigable streams are all of those having an average width of 30 feet. This is a statutory provision.

Taxation of Oil and Gas Leaseholds

The law in Texas is now well settled that oil and gas in place are real property and subject to ownership as such. A landowner may sever his ownership in the oil and gas from his estate in the remainder of the realty by conveying his estate in the surface realty and reserving or excepting his estate in the oil and gas. The estates so served are regarded as entirely separate and distinct. Adverse possession of the surface after severance of the oil and gas will not affect the ownership of the oil and gas estate. The ownership of the oil and gas may maintain a trespass to try title suit to determine a dispute as to the ownership of the oil and gas. The owner of an undivided interest in oil and gas may compel partition thereof.

Oil and gas leases represent an interest in realty in Texas and are subject to separate taxation as such. Though an oil and gas lease be so construed as not to pass a present title to gas and oil in place the courts recognize that it may create a separate taxable estate in land.

INVESTMENT TRUST OF IMPERIAL OIL, LTD.

CHATHAM, Ontario, Jan. 19.—Announcement was made recently by Imperial Oil, Ltd., of the launching in 1929 of the company's third co-operative investment trust. All company employes are eligible who on January 1, 1929, had for one year been employes in good standing of Imperial Oil, Ltd., and its subsidiaries. Deposits are to be made in equal installments, payable monthly or semi-monthly, at the date the employe is paid, or as fixed by the trustees. Deposits shall be at a rate of not more than 10 per cent of the annual salary. For every dollar deposited by the employe, the company will deposits 50 cents; and all money accruing will be invested in the company's stocks, dividends being invested in like manner. An employe withdrawing from the trust shall receive his share of the deposit with interest at 6 per cent, the company's contribution remaining for the benefit of other participants. An employe retiring under the annuity plan or to take employment with a subsidiary will receive the full amount of stock purchased jointly by his deposits, the company's contribution, and dividends, any uninvested balance being payable in cash; and in case an employe-depositor dies, the equivalent stock and cash will be turned over to his estate.

Participants in previous investment trusts who have disposed of more than one-half of their stock are ineligible to participate in the third trust for specified periods.

The trustees of the second co-operative investment trust are expected to close the trust and distribute the stock within a few months. There are some 5,000 individual accounts to be balanced, and close to 100,000 shares to be distributed.

PIONEER OIL REFINER DIES AT TITUSVILLE, PA.

Frank von Tacky, president of the Titusville Oil Works, Titusville, Pa., a pioneer oil refiner of Pennsylvania, died at his Titusville home, Tuesday, January 15. Funeral services were held at Titusville on Thursday, January 17.

Mr. von Tacky, who was 77 years old, had been actively engaged in the refining industry since 1885. At that time with associates he organized a company and built a refinery which is now known as the American Oil Works. In 1885 he became associated with the Titusville Oil Works. In 1898 he bought the present refinery which he continued to operate until the time of his death. He was also president of the Jefferson County Gas Co. with headquarters at Warren, Pa. He was active in several business enterprises outside the oil industry.

He is survived by his widow and five children: Edward F., Frank B. and Clarence L. von Tacky of Titusville; Mrs. J. M. G. Darms of Plymouth, Wis., and Mrs. Charles A. Lutz of Denver, Colo.

DEATH OF F. B. HENDERSON

SAN FRANCISCO, Calif., Jan. 19.—Fred B. Henderson, vice president in charge of sales of the Associated Oil Co., died here last week. He was a pioneer oil man of California and was one of the first to engage in the task of selling fuel oil to railroads in 1894, helping to organize the Associated Oil Co. in 1902. He directed the field operations of the company in the Kern River area and in 1905 became general manager of the Amalgamated Oil Co., a subsidiary, and in 1925 was made second vice president of the Associated and in 1927 placed in general charge of its sales.

Late Fields

(Continued from Page 38)

Maud district of Oklahoma is the Gypsy Oil Co.'s No. 2 Miller, SE cor. SE Section 18-8-5. This well had 20,000,000 feet of gas at 4,109 feet, and evidently drilled itself into the Misener formation. It gauged 3,460 bbls. in 24 hours.

The St. Louis Pool of Pottawatomie County registered 129,589 bbls. from 298 wells for the 24 hours ending Tuesday morning 7 o'clock.

H. F. Wilcox Oil & Gas Co.'s No. 1 Smith, NW cor. SE Section 8-8-5, is flowing 1,000 bbls. daily from the Hunton lime found 4,128-60 feet, and is being drilled deeper.

KANSAS

Another well is in the making in the Sedgwick area. It is the Barnsdall Oil Co.'s No. 1 Samuels, NE cor. NW Section 24-25-1e, which is in chat at 3,055 feet and swabbed 70 bbls. the first 3 hours, and is now shut down.

In Marion County district of Kansas the Empire Gas & Fuel Co.'s No. 1 Seiderman, SE cor. NE Section 12-19-2e, swabbed 104 bbls. the 21 hours ending 7 a.m. Tuesday. It will be drilled deeper from its present total depth of 2,825½ feet.

EAST CENTRAL TEXAS

CORSICANA, Tex. Jan. 21.—Daily average production of the East Central Texas district totaled 21,551 bbls., a decrease of 599 bbls. Figures by fields are:

East Central Texas

Boggy Creek	2,325
Cedar Creek	240
Currie	529
Mexia	6,104
Minerva	710
Nigger Creek	410
Powell	9,287
Richland	456
Thrall	35
Wortham	1,455
Total this week	21,551
Total last week	22,150
Decrease	599

GULF COAST

HOUSTON, Tex. Jan. 22.—That another coastal field is being opened is indicated by Vacuum Oil Co.'s No. 1 Devilbiss, on the Roanoke Dome prospect in Jefferson Davis Parish, Louisiana, in which test 3-inch tubing was being set Tuesday. Screen was set in the test Monday and the well slopped over but, probably due to the fact that casing in the hole is 9⅝-inch, the well would not flow. When tubing is set it is expected to make a 300 or 400-bbl producer. The bottom of the hole is in a sandy shale at 4,188-4,200 feet with the casing set at 4,176 feet. The Roanoke Dome was checked with the torsion balance by the Vacuum Oil Co. during 1928 and with the exception of a shallower test drilled several years ago by the Osage Oil Co. a mile north, the present test is the only one drilled in that district.

Gulf Production Co. completed a good shallow well in the Boling Field in its No. 17 Chase, which came in flowing 500 bbls. daily at 773 feet. This company's No. 6 McLean, South Liberty shallow pool, is flowing 400 bbls. daily at 832 feet. T. G. Shaw and Texas Exploration Co.'s No. 2-D Fitzsimmons, a semi-wildcat at Pierce Junction, was abandoned Monday in heaving shale at 4,300 feet.

MARLAND OIL OF CALIFORNIA

D. J. Moran, president of Marland Oil Co., has been elected president of Marland Oil Co. of California, to succeed F. R. Kenny, and H. G. Thompson has been elected secretary-treasurer to succeed H. G. Beal.

NEW NORTHERN P. L. DIRECTOR

J. P. Blackford has been elected director of Northern Pipe Line Co., succeeding William A. Schnader. Other directors were re-elected. Officers were re-elected.

PHYSICIAN SUGGESTS REMEDY FOR NITROGLYCERIN HEADACHE

By C. R. Treat, M. D.*

For years dealers in explosives have been searching to obtain alleviation for the so-called "dynamite headache," or "powder headache," as it is frequently known. I am glad to say that a cure has been found at last.

Six years ago I instituted intensively an investigation of this harassing malady. A study of its pathology revealed the causation to be due to the absorption of nitroglycerin into the system; first, through the upper respiratory tract, that is, by inhalation; and, second, through the pores of the skin in handling. The outstanding feature is that it is not cumulative; in fact, it is rapidly eliminated, the effects in medicinal doses fading in about two hours. Besides, there is no immunity as applying to drug agents—the phenomenon obtaining in diseased processes only—although a "tolerance" is created in some instances, but not so relatively with dynamite. With nitroglycerin there is no such thing as "tolerance," for the reason that it is very rapidly eliminated. All drugs that are rapidly eliminated do not allow of "tolerance," but those that are eliminated slowly are cumulative and practically permit of physiological "tolerance" becoming induced.

Effects on the Human System

Now, the first effect of nitroglycerin being taken into the system in moderate amounts is that it produces its characteristic physiological action, viz., a dilation of the blood vessels all over the body, with a concomitant fullness in the head. When the absorption goes a step further and is sufficiently great, the initial symptoms of poisoning become manifest by an over-dilation of the blood vessels in the brain, which is directly responsible for the well-known intense throbbing and sickening headache all too familiar to those who work with dynamite and nitroglycerin explosives.

Considering the pathological action of nitroglycerin in producing this symptom, I realized that there should be accordingly a physiological antidote that would exert its action directly opposite. A physiological antagonist, ergot, was an agent producing a counterpart effect, so I proceeded to use it in a number of cases, but, to my bitter disappointment, it utterly failed to yield results. Carrying my investigation further, I enlisted the services of a reviewer to cover the literature of the allopathic, homeopathic, and eclectic schools of medicine on the subject. I further consulted the investigation department of the Journal of the American Medical Association, also several other leading medical journals of this country and the Chemical Warfare Service at Washington, D. C.

Formulation of the Compound

Delving into this mass of data, and giving it considerable thought and study, it was concluded that we must possess available drugs which, when combined, would counteract the phenomenon. I formulated a combination consisting entirely of vegetable origin, containing mainly jessamine (gelsemium), calabar bean (physostigma), and henbane (hyoscyamus), together with other synergists, and the recently discovered ephedrine, and made up extemporaneously a batch of capsules, incorporating these various ingredients, for dispensing. The conclusions were reached empirically, rather than by meeting pathological indications.

I then proceeded to carry my experiments further, and as there was ample material to demonstrate the efficacy of the remedy, it was possible to prescribe it whenever the occasion demanded, besides sending a sample to the Institute of Makers of Explosives, New York, for their opinion. After using the formula for several hundred routine cases, it was observed with a great deal of satisfaction that it was effective, without a single failure. To date the results have been uniform, without even a single exception in any isolated instance. Moreover, this remedy not only cures the headache after it comes on, but will also prevent it if taken before the individual engages in working with explosives.

Accordingly, for further use, several thousand tablets of this formula were made up by a reliable pharmaceutical house and these are available (gratis) to anyone in sufficient number to give a thorough tryout. A copyright is pending at the present time on the formula.

During the course of the study, several prominent companies which manufacture explosives were consulted, and in answer to our inquiry as to whether there was any known cure for "powder headache," the replies were practically uniform that there was none such in extant. The following letter is representative of the attitude of the makers of explosives in general:

HERCULES POWDER CO., Inc.
Wilmington, Del., May 14, 1928.

Dr. C. R. Treat, Chico Tex.

Dear Sir:

We have never found a satisfactory relief for "dynamite headache." Usually nature adjusts itself in two or three days so that men become more or less immune. But sometimes we find that we have men who cannot become accustomed to the physiological effect of the nitroglycerin and we have to remove them from contact with explosives containing it.

Immunity, to those who enjoy it, is not lasting. Usually old powder workers have some degree of headache on resuming work Monday mornings. Twenty-four or 48 hours seems sufficient time for immunity to be lost to some individuals.

A great deal of thought and research have been devoted to the study of nitroglycerin and its physiological effect, and while a cure or definite relief has not been discovered, this we do know—that the effect is not cumulative. However, a subject with high blood pressure or abnormal heart might be indirectly injured by continuous contact with nitroglycerin.

Some few of our men use aspirin in appropriate doses; they claim it gives them relief. Personally, the writer worked in nitroglycerin for a good many years and found the only relief was sleep with elevated head and shoulders. The drinking of any liquids intensifies the headache, and stimulants are still more severe.

Truly yours,
John S. Shaw, Manager.
Safety and Service Division.

Notwithstanding the opinion of explosive makers and others to the contrary, permit me to state unequivocally and without fear of refutation, that we now possess at our command a perfect and complete cure. This remedy has stood the most rigid tests, with observations extending over a period of months. I was led to conduct my experiments, with the subsequent development of a successful cure, by the urgent demand not only manifest by employes suffering and handicapped by this distressing ailment, but also by the consideration of lower efficiency as a result of it, and by the loss of man-hours entailed.

*Industrial Surgeon Appointee, Texas Employers Insurance Association, Dallas, Tex. Contract Physician to the Employes of the Southwest Stone Co., Chico, Tex. Reprinted from "Rock Products."

NEW TANKS NEAR LULING

Magnolia Petroleum Co. has started the construction of two 80,000-bbl. tanks at its tank farm just outside of Luling in Caldwell County, Texas. One tank of that size was recently completed. These are in addition to 40 or more tanks on the farm that have been there for some time. No new construction was started until recently when the Joe Bruner-Salt Flats Field started development and daily runs from the new field became important.

CRITICIZED POINTS IN MEASURE EXPLAINED

(Continued from Page 29)

the plan deprives the operator who drills in the discovery well of the discovery value of his lease. That criticism is squarely answered by the provision of the bill that compulsory co-operative development cannot be brought about excepting where a majority of the production, as well as a numerical majority, and those holding a majority of the acreage, join in the petition for the compulsory development and operation of the pool. Therefore, the discoverer by refusing to join can block compulsory development completely.

The third point raised by Mr. Kates is that this bill had its inspiration in the decision of the Supreme Court of the United States in the Ohio Oil Co. case. He then raises the question as to whether a statute so constructed would meet the rule of property prevailing in the State of Texas. This point might be answered by the statement that a committee of Texas oil lawyers have already agreed to the principle of this bill for enactment in Texas. Furthermore, the rule laid down in the Ohio Oil Co. case is not the sole, nor even the chief foundation for the legislation proposed. The committee in its report at no time intimated that there was a community interest in the oil vested in the operators in the same pool. It did take the position, however, that there was a community interest among them in respect of the gas energy which produces the oil. In other words, that the waste or inefficient use of this energy by one operator was a detriment to the other operators in the same pool and that the state had the power to protect the operators in their community right to the gas energy which is the chief propulsive force in producing the oil.

ARRANGE PROGRAM FOR TEXAS OIL EXPOSITION

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and A. J. Clark. The athletic program and barbecue are to be handled by Mr. O'Bannon. The dance music and registration arrangements are in charge of Walter Henshaw. The land man's committee is headed by Mr. Clark and the scout's committee is headed by Ed Dilley.

Clarence Gilmore, chairman of the State Railroad Commission; Lon A. Smith, a member of the commission; and J. T. Robison, state land commissioner, are among state executives who are to address the convention at its business sessions. Other speakers are Dr. F. B. Plummer of the Bureau of Economical Geology of the University of Texas; Dr. C. N. Gould of the geology department of the University of Oklahoma; Ford Turner, head of the land and scouting departments of the Pure Oil Co.; and Earl Whitcomb, land man and scout for the California Co.

The possibilities of new petroleum discoveries in the Permian Basin, where actual development in a little more than five years has surpassed any other in the Southwest, are pointed to as likely to draw many oil men as visitors.

HERBERT RE-ELECTED PRESIDENT OF MARSHALS

(Continued from Page 38)

ty Council, spoke on special hazards in fire fighting. He stressed the necessity of fire drill at refineries.

The remainder of the one-day meeting was largely given over to a discussion of problems of interest to the fire marshals. Committees were appointed to investigate vapor detectors and methods of determining whether or not pipes, filters and so forth are properly grounded against static electricity and methods of cleaning gasoline tank cars safely.

Other officers elected for the coming year were Sherman Brown, Mutual Refining Co., secretary and treasurer, and Frank G. Benedict, Sinclair Consolidated Oil Corp., vice president.

Metals Meeting Gives Petroleum Important Place in Its Program

By L. P. Stockman

LOS ANGELES, Calif. Jan. 22.—The oil industry played an important part in the first Western Metals Congress held here January 14 to 18 and devoted to virtually every line of metallurgy. The California division of development and production of the American Petroleum Institute, California Chamber of Mines and Oils, the American Institute of Mining and Metallurgical engineers and various oil and equipment supply companies sponsored important sessions during the congress.

F. W. Lake, production superintendent for the Union Oil Co., addressed the congress on "Sucker Rod Strains and Stresses." K. V. King of the Standard Oil Co. delivered a paper on "Casing Failures." Technical papers were presented also on "Valves and Fittings in the Oil Refinery," by V. T. Malcolm; "Tool Joints," W. H. Fisher; "Cast Steel Slush Pumps," Lester Keim; "Kellys or Grief Stems," Glenn Merkley; and "Sucker Rods," W. H. Laury.

Plant inspections were available daily to all members of the congress beginning with a field trip through the Long Beach Field under the guidance of the Shell Oil Co. This trip, which included inspection of the Shell's natural gasoline installations at Long Beach, covered all phases of field work from drilling to producing. The General Petroleum Corp., Western Drop Forge Co., Axelson Machine Co., Union Tool Co., Doheny Stone Drill Co., The Stoody Co., H. C. Smith, Emsco Derrick & Equipment Co., Columbia Steel Mills and others concerns conducted visitors through their plants.

There were approximately 500 delegates present when Wade Hampton, of the Hughes Tool Co. and chairman of the American Society for Steel Testing, called the initial meeting to order. One of the most interesting features in connection with the Western Metals Congress was the large amount of both light and heavy machinery and equipment on exhibition at the Shrine Auditorium, where all afternoon technical sessions were held. It was generally agreed that the Los Angeles congress was the most successful meeting of this kind ever held from the standpoint of both attendance and displays.

ENGINEERING DIVISION SELECTS 1929 OFFICERS

At a meeting of the Mid-Continent section of the Division of Development and Production Engineering of the A.P.I. held in Tulsa, January 21, the following officers of the Mid-Continent section for 1929 were elected: Chairman, J. R. McWilliams, Skelly Oil Co., Tulsa; vice chairman, W. K. Whiteford, Barnsdall Oil Co., Tulsa; secretary-treasurer, Floyd Hall, Tidal Oil Co., Tulsa. It was also voted that it be an established custom for the chairman, vice chairman and secretary-treasurer of the preceding year to act as an advisory committee for the purpose of assisting the officers of the current year. Serving on this advisory committee for 1929 are C. D. Watson, C. V. Milliken and W. K. Whiteford.

Plans for the work of the Mid-Continent section during 1929 were discussed in detail. Mr. McWilliams proposed that a system of so-called chapter meetings in the various fields and cities throughout the Mid-Continent area be started so that field men might more conveniently enter the activities and work of the A.P.I. This proposal was favorably received. It was agreed by all present that the success of the Division of Development and Production Engineering depends primarily upon the field men because the A.P.I. and the petroleum producing industry itself are neither of them "white collar" outfits. Mr. Watson and Mr. Whiteford called attention to the very important part that field men played in the Tulsa meetings of the Mid-Continent section last November when 14 field men who were not engineers contributed valuable discussions.

Mr. Whiteford and others emphasized the advisability of work upon practical field problems, leaving the more technical and scientific problems to be covered by the A.I.M.E. and other technical associations.

MARLAND PRESIDENT OF ROYALTY ASSOCIATION

FORT WORTH, Tex., Jan. 21.—E. W. Marland was elected president and Fort Worth selected as the general headquarters of the Mid-Continent Royalty Association which completed its organization at a meeting here.

Other officers of the general association elected include Wade H. James of Tulsa, vice president; E. G. Bedford of Midland, treasurer; L. E. Wandell, secretary, and Guy H. Woodward of Tulsa, general counsel. The board of directors of the general association includes Marland, Bedford, L. H. Wentz of Ponca City, R. P. Brewer of Tulsa, P. N. Wiggins, Jr., of Tulsa, J. F. Lucey of Dallas, R. E. Harding of Fort Worth, S. M. Gloyd of Oklahoma City, Frank Buttram of Oklahoma City, J. J. Cotter of New York, J. H. Clark of Tulsa, Wade James of Tulsa and H. R. Hinton of Tulsa. The Texas University board of regents will be invited to have a representative on this board as well as on the board of the Texas division, since it is one of the largest royalty owners in the industry.

E. G. Bedford of Midland, who has been president of the Winkler Royalty Owners Association, was the unanimous choice for president of the Texas division; vice presidents, Capt. J. F. Lucey, C. T. Watson and A. R. Eyssell; W. E. Wandell of Midland, secretary. The executive committee is made up of Ralph Cummins, Southland Royalty Co.; C. P. Watson, Federal Royalty Co., both of Fort Worth; R. G. Carr of Midland, H. F. Gibson and E. G. Bedford.

The following directors were elected for the Texas division:

Amarillo district—Neil Johnson and Earl R. Calloway.

Wichita Falls district—Dudley Golding, Clint Wood and W. J. Moran.

Fort Worth district—Ralph Cummins, C. P. Watson, W. N. Waddell, R. A. Bristol and J. B. Wheeler.

Dallas district—Capt. J. F. Lucey, P. S. Godfrey and R. T. Meador.

Coleman, Abilene and Brownwood district—J. R. Wallingford, J. T. Cross and W. S. Duty.

Ranger, Eastland and Cisco district—Walter Gohlson and Mrs. Lydia H. McMullen.

Midland, Big Spring and Colorado district—J. L. Crump, A. R. Carmody, W. F. Scarborough, E. G. Bedford and L. E. Wandel.

San Angelo district—V. E. Cottingham, I. G. Yates, R. G. Carr, L. L. Farr and A. R. Eyssell.

San Antonio and Gonzales district—E. D. McMahon and Jax Cowden.

Houston district—Andrew Sorrell.

Beaumont district—J. E. Broussard.

Corsicana and Mexia district—E. L. Smith.

Jacksonville and Palestine district—Gus Blankenship and M. A. Davey.

GIBSON ELECTS NEW OFFICERS

Virtual reorganization of the Gibson Oil Corp. was effected at a meeting of the stockholders January 9 in the general offices of the company in Amarillo, Tex. Walter D. Caldwell, formerly vice president of the State National Bank of Oklahoma City, Okla., was elected president; Carl S. Aune, land man and geologist of the company, secretary; and Robert L. Smith, vice president of the American First National Bank of Oklahoma City, treasurer. Mr. Smith was elected also to the board of directors, as were W. F. Hull, secretary and treasurer of the Empire Bond & Mortgage Co., New York, and C. Bascom Slemp, lawyer and capitalist of Washington, D. C., and former secretary to President Coolidge.

OIL OPERATORS WIN RIGHT TO APPEAL

WASHINGTON, D. C., Jan. 21.—Oil companies operating in Osage County, Oklahoma, gained their point when the House Indian Affairs Committee tacitly agreed on an amendment to the pending Osage bill which would give the operators as well as the owners of the surface land the right to appeal to the courts from decisions of the Secretary of the Interior on damages resulting from their drilling operations.

At the hearing today, J. George Wright represented the Tribal Council. Paul Humphrey appeared for the surface owners and H. H. Smith for the oil operators.

The compromise adopted, while it does not require the surface owners to prove negligence on the part of the oil operators in obtaining recompense for damages, gives the latter the right to go to either the Federal or state courts with their appeal and changes the existing law to cover all classes of damages.

It also provides for arbitration as a precedent to the right to sue. The committee approved the amendment to the 1906 bill by which the tribal rights to minerals would be extended after 1931, the present expiration date, to April 8, 1958, "and as long thereafter as oil or gas or other minerals are found in paying quantities."

ROBERT L. WELCH DIES AT PHOENIX, ARIZONA

(Continued from Page 3)

telegraph operator. He knew poverty and worked his way through school, all the while continuing as night telegraph operator for the Western Union. He was a graduate of Des Moines College and the University of Chicago. He obtained his degree in law at Northwestern University Law School. He later continued his study of the law at Harvard.

"Mr. Welch made a name for himself as an Iowa lawyer. His conspicuous ability inevitably led him into broader fields of activity. His association with the oil business began as counsel for the Iowa Oil Jobbers Association about 15 years ago. Next he became counsel for the old Western Oil Jobbers Association in Chicago. Following this he became secretary and counsel for the Western Petroleum Refiners Association at Kansas City. He functioned brilliantly as a member of the National Petroleum War Service Committee of which the late A. C. Bedford was chairman. When the American Petroleum Institute was organized, Mr. Welch was unanimously chosen to become its active officer and to lead its destiny.

"The oil industry has lost a faithful friend and servant who for more than 15 years has given his best, his all. He will be mourned by the thousands of oil men who knew him and who appreciated his invaluable service. Those of us who served with him here will affectionately cherish his memory."

PURE POSTS PRICE AT MIDLAND

The Pure Oil Co. has posted a price of $1.79 per barrel at the well for oil produced in the Midland Field in Michigan.

Charles H. Oles Dies In Amarillo Hospital After Week's Illness

Charles H. Oles, 60, of Independence, Kans., general auditor of the Prairie Oil & Gas Co., died in a hospital in Amarillo, Tex., Sunday, January 20, following a week's illness with pneumonia.

His wife and two sons, Paul and Lawrence, were at the bedside when the end came. Paul is a geologist with the Prairie Oil & Gas Co. at Wichita Falls, and Lawrence is a geologist with the same company at Amarillo.

Mr. Oles had been with the Prairie Oil & Gas Co. as general auditor for 19 years. Previous to that time he was with the East Ohio Gas Co. at Cleveland, Ohio, and the National Transit Co. at Oil City, Pa.

He came to Amarillo to audit the books of subsidiaries of the Prairie Oil & Gas Co. and expected to remain there about three months.

The funeral was held from the Presbyterian Church in Independence, Kans., Wednesday afternoon with Dr. Guymon, pastor of the church, in charge.

Interment was in the Independence cemetery.

GULF COAST MARKET QUOTATIONS STEADIER

HOUSTON, Tex. Jan. 22.—A better movement of lubricating oils the past week, together with some additional buying of fuel oils, was reflected by a steadier tone in these products Monday and Tuesday. Although there still is some tendency toward concessions on lubricating stocks, sellers as a whole are holding to steady quotations. One large refining company which recently replaced gas with oil for fuel was forced into the market during the week to fill outside requirements. This refiner purchased a minimum of a cargo. With the general fuel oil situation improved, sellers at the opening of the week were renewing efforts to prevent any weakening and were holding tight on their prices. Sellers Tuesday were demanding from 90 cents to $1 for bunkering ships on the channel and cargo lot movements are being held from 70 to 75 cents on bunker C grade. One cargo was offered at 68 cents but that is the absolute low.

Gas oil is slightly off in price although uncracked stock or products of low sulphur content from Gulf Coast crudes is scarce at 4 to 4¼ cents. Cracked stocks, however, are easy at 3⅝ to 3⅞ cents as are the higher sulphur oils. Movement of lubricating oils is chiefly in small tank car lots but of such volume as to be encouraging. Lighter viscosity oils continue to be chiefly in demand.

OIL SECURITIES HEAVY, WITH LITTLE BUYING

(Continued from Page 141)

based to some extent on participation in earlier plans.

Stockholders of record February 5 will be entitled to vote at the annual meeting. The proxy committee named by the management consists of R. W. Stewart, chairman of the board; E. G. Seubert, president, and F. T. Graham, secretary.

OIL BONDS ON THE NEW YORK CURB
Quotations Compiled by Francis, Bro. & Co., Members New York Stock Exchange, Kennedy Bldg., Tulsa, Okla.

Amount	Company	Date	Pct.	Int.	For week ended Jan. 18 Sales	High	Low	Close
11,603,000	American Nat. Gas. Co.	Oct. 1942	6½	A&O	No sales.			
3,000,000	Beacon Oil Co.	Nov. 1936	6	M&N	No sales.			
18,900,000	Cities Service deb.	Jan. 1966	6	M&N	No sales.			
15,000,000	Cities Serv. refunding deb...	Jan. 1966	5	M&S	8,000	90¾	89⅝	90⅜
24,843,700	Cities Service Gas Co.	May 1942	5½	M&N	4,500	92	91	91⅛
12,000,000	Cities Service Gas P. L. Co..	Jan. 1943	6	J&J	6,500	98¼	98	98⅛
12,000,000	Continental Oil Co.	Nov. 1937	5¼	M&N	3,500	96	94⅝	95
3,000,000	Dixie Gulf Gas Co. A	Sept. 1927	6½	M&S	6,400	88½	87	88
18,000,000	Empire Oil & Ref. Co.	Apr. 1942	5½	A&O	7,300	91¼	90⅛	91
3,877,100	Galena Signal Oil Co.	Apr. 1930	7	A&O	2,400	100¾	100⅝	100⅝
30,904,000	Gulf Oil of Pa.	Dec. 1937	5	J&D	9,000	101⅝	100¼	100⅜
12,000,000	Gulf Oil of Pa. debs.	Feb. 1947	5	F&A	8,500	101⅝	100¼	101⅛
4,000,000	Houston Gulf Gas	Apr. 1943	6	A&O	8,800	91¼	90½	91⅛
4,000,000	Houston Gulf Gas	Apr. 1943	6⅛	A&O	4,500	92	91	91⅝
6,339,000	Independent Oil & Gas	Mar. 1939	6	M&S	11,000	108½	106⅛	106⅝
15,000,000	Lone Star Gas Co.	May 1942	6	M&N	3,000	99⅛	99⅛	99
14,650,000	Richfield Oil Co.	Sept. 1941	6	M&S	3,800	120	115¾	119
1,427,000	Richfield Oil Co.	Jan. 1931	5½	J&D	4,400	102½	101⅛	102
9,733,000	Sun Oil Co.	1939	5½	M&S	800	101	100⅝	100⅝
4,000,000	Transcontinental Oil Co.	Apr. 1930	7	A&O	No sales.			
2,500,000	Warner-Quinlan Oil Co.	1942	6	A&O	No sales.			

Gas Analyses in Plant Operation

Can Be Used in Determining Production of Finished Products and Also Serve as Check on Operating Efficiency

By Gas and Gasoline Analysis Committee of the California Natural Gasoline Association

Natural gas and the natural gasoline extracted from it are complex mixtures of hydrocarbons of the methane series. Natural gas always contains methane, ethane, propane, iso-butane, n-butane, iso-pentane, n-pentane, n-hexane, di-isopropyl and heavier hydrocarbons in varying percentages; in addition, there may be present in appreciable quantity, helium, nitrogen, oxygen, carbon dioxide and hydrogen sulphide. The less volatile of these components may be removed from the gas by such processes as compression, absorption in oil or adsorption with charcoal; the resulting product, natural gasoline, contains all but the most volatile of the hydrocarbons present in the gas.

Both natural gas and natural gasoline are, therefore, highly complex mixtures of substances very similar in their charcoal reactions and differing, mainly, in boiling point, which progressively rises from the very low boiling point of methane,—161.4 degrees Centigrade (—259 degrees Fahrenheit), to even a very high boiling point, such as that of n-decane, 173 degrees Centigrade (343 degrees Fahrenheit), for the higher molecular weight members of the methane series.

Until recently, the analysis of such complex mixtures was an involved and difficult procedure possible only for a skilled laboratory technician provided with costly and complicated apparatus and with a well-equipped laboratory. For this reason, the development of the industry to date has taken place for the greater part without exact knowledge of the composition of its raw materials and its intermediate and finished products. Empirical tests were, however, developed such as the charcoal test to indicate at least approximately the potential production of gasoline from gas, and the A.S.T.M. distillation test for use in specifications for the finished gasoline. While these tests were and are, of great value to the industry, there has been felt more and more the need for methods of analysis which would determine the actual composition of natural gas and gasoline in terms of the individual hydrocarbons present, and which would be simple, rapid and accurate enough for universal use in industrial testing laboratories. The advantages of such a method of analysis for testing plant and equipment efficiency to furnish data for plant and equipment design, for plant control work and for research have always been obvious.

Such methods of analysis have been developed and are being used more and more by the industry. As with any new test, it is necessary to learn how to use the test properly and to realize to the utmost the advantages that it offers. The task of investigating the possibilities and applications of the method of fundamental analysis of natural gasoline to the operation of a natural gasoline plant has been taken up by a committee of the California Natural Gasoline Association and this paper is to be taken as a progress report of its activities to date.

Methods of Analysis

The foundation of modern methods for the analysis and study of gases has been well laid in the classical investigations by Ramsey and Travers, described in a book, "Study of Gases" by Travers. One of the pioneer methods for the actual analysis of natural gas into nitrogen, methane, ethane, propane, butanes and pentanas—and heavier was developed by G. A. Burrell and his associates for the United States Bureau of Mines and is described in Technical Paper No. 104. In Burrell's method a gas sample is liquified with liquid air and subjected to a series of simple distillations at very low temperatures and pressures at which it is possible to secure better separation of the components in the gas than at atmospheric pressure. Fractions are thus distilled from the liquified gas which are practically binary mixtures and are analyzed by the standard slow-combustion test.

While accurate results are said to be possible with the Burrell method, the excessive time required, from two to three days per analysis, the tedious manipulation necessary, and the large quantities of liquid air required, as well as the fact that this method is not applicable to the analysis of natural gasoline, has rendered its use in the natural gasoline industry impracticable. In order to shorten the time required for an analysis, Martin Shepherd and Frank Porter* devised a much more elaborate apparatus based on the same principle, to reduce the time required for an analysis to about 8 or 10 hours. Their apparatus is also limited in its application to gaseous mixtures. It is used with more or less modification by several laboratories in this country, although the complexity of the apparatus and the excessive time and cost per analysis have prevented its more universal use.

In order to develop an analytical apparatus for natural gas and gasoline which would not possess the handicaps of complexity, fragility, excessive time and cost per analysis, and need for a skilled laboratory technician, an investigation was carried out at the University of Michigan (August, 1925, to July,

(Continued on Page 160)

TABLE 1—COMPARISON OF FUNDAMENTAL ANALYSIS WITH CHARCOAL TEST

Hydrocarbon—	No. 1 % Gas Vol.	No. 1 G.P.M.	No. 2 % Gas Vol.	No. 2 G.P.M.	No. 3 % Gas Vol.	No. 3 G.P.M.	No. 4 % Gas Vol.	No. 4 G.P.M.
Methane	72.40	....	76.41	....	78.40	....	70.80	....
Ethane	9.34	....	12.00	....	7.06	....	9.92	....
Propane	8.49	....	7.78	....	5.78	....	8.14	....
Iso-butane	1.70	.56	.94	.31	1.42	.46	1.89	.62
N-Butane	4.60	1.45	2.59	.82	2.85	.93	4.37	1.38
Iso-pentane	....	....	....	....	1.03	.38	1.65	.60
N-pentane	....	....	....	....	.87	.31	1.06	.38
Hexanes	3.47	1.42	.28	.12	2.59	1.45	2.17	1.22
Total	100.00	3.43	100.00	1.25	100.00	3.53	100.00	4.20
Charcoal test (30-lb. – 32° F)		3.34		1.22		3.34		4.08

Hydrocarbon—	No. 5 % Gas Vol.	No. 5 G.P.M.	No. 6 % Gas Vol.	No. 6 G.P.M.	No. 7 % Gas Vol.	No. 7 G.P.M.
Methane	91.37	....	89.32	...	89.07	...
Ethane	3.19	....	2.01	....	2.75	....
Propane	4.70	....	4.29	...	4.21	...
Iso-butane	.46	.15	.73	.24	.75	.25
N-Butane	.28	.09	2.06	.65	1.89	.60
Iso-pentane	....	....	....	....	....	....
N-pentane	....	....	....	....	....	....
Hexanes	....	....	1.59	.65	1.33	.55
Total	100.00	.24	100.00	1.54	100.00	1.40
Charcoal Test (30-lb. – 32° F.)		.27		1.43		1.15

*"An Improved Method for the Separation of Gas Mixtures by Fractional Distillation at Low Temperatures and Pressures," Journal of Industrial and Engineering Chemistry, Nov. 1923, pp. 11 and 3-1,146.

Remove Sulphur From Refinery Gas

Liquid Purification Process Purifies Gases From Cracking Stills. Also Used by Natural Gas Companies

By D. L. Jacobson
The Koppers Company

Sulphur compounds occur as objectionable impurities in natural gas from many fields and in much refinery still gas. These same impurities are also found in gas manufactured from coal. Practically all of the sulphur present in these gases is in the form of hydrogen sulphide, so that no other sulphur compound need be considered of importance in the purification of either coal gas or natural gas.

Processes for removal of hydrogen sulphide from gas were first developed by the coal-gas industry due to the harmful effects of hydrogen sulphide to the consumer and his home. These injurious effects led to stringent legal requirements for the removal of hydrogen sulphide from gas intended for sale.

The older method of purifying coal gas, the iron oxide box system of gas purification, is too cumbersome, laborious and expensive a method of gas purification to be applied to natural gas and refinery still gas, especially when it is considered that natural gas, and refinery still gas must usually be purified under a relatively high pressure and that these gases often contain much higher amounts of hydrogen sulphide than coal gas. These were conditions which the iron oxide box system of purification could not meet satisfactorily and economically, so that in the past there was no practical method available for purifying natural gas and refinery still gas.

The iron oxide system of purfication has many disadvantages for the purification of coal gas as well, particularly the large ground space requirement and the labor involved. About eight years ago, The Koppers Company developed to a plant scale a new method of liquid purification, known as the Seaboard Process, which is covered by United States Patents 1,389,980-1,390,037 and other patents. In this* process a liquid is used as the purifying agent instead of the dry iron oxide material. This Seaboard Process was rapidly adopted in a large number of coal gas and water gas plants. At the present time a total of 300,000,000 cubic feet of various kinds of gas are being purified daily by this process in America, Europe and Japan, in plants constructed or licensed by The Koppers Company.

TABLE 1—LIQUID PURIFICATION PLANTS

Purifying Natural Gas or Cracking Still Gas by the Seaboard Process

Name of company, location and type of gas—	(†)	(‡)	($)
Gulf Prod. Co., Crane County, Tex. (Odessa), natural	500,000	20–30	7,000
Ill.-Mo. Pipe Line Co., Wood River, Ill., cracking still gas	6,000,000	50–80	1,000
The Texas Company, Port Arthur, Tex., cracking still gas	2,500,000	Atmospheric	1,000
So. Ontario Gas Co., Glenwood, Ont. (Tilbury Field), natural	6,000,000	70–125	450
Royalite Oil Co., Calgary, Alberta, natural	20,000,000	270	650
Union Natural Gas Co., Chatham, Ontario, natural	15,000,000	90	400
Carbide & Carbon Chem. Corp.*, Charleston, W. Va., cracking still gas	5,000,000	175–200	300
Total	55,000,000		

*Under construction. †Rated capacity cubic feet/day. ‡Gas pressure pounds/square inches. $Hydrogen sulphide content of gas—gr./100 cubic feet.

Advantages of Process

The Seaboard Process of liquid purification is particularly adapted to the needs of the natural gas company or refinery that must remove the hydrogen sulphide from its gas, due to its ready use under high pressure, the low investment and operating cost and to the simplicity with which it is operated. In the past few years, seven plants have been built with a total capacity for purifying 55,000,000 cubic feet of natural gas or refinery gas per day. These are listed in Table 1. There will no doubt be a considerable number of other natural gas companies and refineries who will adopt the Seaboard Process for removal of hydrogen sulphide in the near future, as it is the only process that has been put into successful operation on a large scale for this type of gas.

There are two main reasons for the removal of hydrogen sulphide from natural gas and refinery still gas: First, where the gas is intended for domestic use, or where the gas is to be mixed with coal gas, water gas, producer gas, etc., for domestic sale, it is obvious that the hydrogen sulphide must be removed for the same reasons that necessitate its removal from coal gas intended for domestic sale, such as odor, corrosion of appliances, blackening of paints, tarnishing of silver, etc., which as previously mentioned have led to legal restrictions. Secondly, in many cases where the gas is to be used for combustion in gas engines or is to be treated for recovery of gasoline, or is to be compressed for long distance transmission[1], the prevention of serious corrosion of compressors and pipe lines and of corrosion in the gasoline recovery plant will more than pay for the cost of a Seaboard liquid purification plant within a short time. The prevention of interruptions to regular operation due to corrosion is also an important factor in favor of a purification plant. Corrosion due to hydrogen sulphide is particularly serious where moisture or oxygen is present in natural or refinery still gas.

Prevention of Corrosion

In some cases, where a liquid purification plant has been installed primarily for the purpose of purifying gas for domestic sale, it was noted later that a considerable saving in plant equipment has been effected, due to prevention of corrosion. This has been true for example at the Chatham, Ontario, plant, as mentioned by V. Lauriston[2]. This installation is purifying 15,000,000 cubic feet of

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*An early description of this process was published in The Oil and Gas Journal December 2, 1926, page 186.

[1]See article by H. C. Cooper in American Gas Association Monthly, November, 1928, page 725, entitled, "Long Distance Transmission of Gas."

[2]V. Lauriston—Can. Chem. and Met. V. 10, 1926, page 30.

Of Interest to Sales Departments

Sales Consolidation Of Allied Companies In Imperial Refineries

The organization of the Imperial Refineries which will handle the sales of allied companies operating four refineries was announced during the past week at the Tulsa headquarters.

The companies involved in the sales consolidation and their refinery locations are as follows: Imperial Refining Co., Ardmore, Okla.; Kettle Creek Refining Co., El Dorado, Ark.; San Angelo Refining., San Angelo, Tex. and Wickett Refining Co., Wickett, Tex. W. B. Hassett of Tulsa, a widely known refinery operator is president of the San Angelo, Imperial and Kettle Creek companies and treasurer of the Wickett company. The companies are owned by Mr. Hassett and associates. The Kettle Creek and Imperial refineries have been operated for several years. The Wickett plant was built during the past year and the San Angelo plant was taken over by the present management during 1928.

Under the reorganization plan the sales of the companies will be centered in the Tulsa office. The trade-mark as shown in the accompanying sketch with red and ivory colors has been adopted and all products will bear this name. Under the direction of Clive M. Alexander, general manager of the companies the operation of the four refineries has been correlated so that the output conforms to a standard which has been established for the Imperial Refineries products. R. M. Moon, for several years sales manager of the Imperial and Kettle Creek companies, has been appointed sales manager of the Imperial Refineries. C. L. Seideman is traffic manager.

Among the products offered by the new sales organization is "Imperial Hundred Percent" and "Ideal Flight." The first named product is a premium grade of antiknock gasoline and the latter is a high product for the aviation trade.

PIERCE PETROLEUM CORP. ADDS SUPER STATIONS

CHICAGO, Jan. 19.—The Pierce Petroleum Corp., of St. Louis, announces plans for the building of a string of stations between St. Louis and the Southwest of the same type as the company has constructed at Springfield, Mo. These stations will include a service station, restaurant, news and candy stands, auto accessories, bus ticket offices and the like.

It is stated that the cost of each station will be approximately $125,000, and that the plan finally may include a line across the country. The stations already built are said by those in touch with their operation to have proved successful and profitable.

GASOLINE DEMAND SHOWED 11.5 PER CENT GAIN FIRST 11 MONTHS

By H. K. Davis
Economist, Western Petroleum Refiners Association

The Bureau of Mines recently issued the monthly petroleum statement for November, 1928. A study of the tables discloses many interesting facts, some of which, for the United States as a whole, follows:

Gasoline production, 11 months, 1928, equalled 99.1 per cent of amount shipped from refineries, resulting in draft on stocks since January 1 of 137,000,000 gallons; same period of previous year production equalled 97.2 per cent of amount shipped, resulting in draft on stocks since first of year, 1927, to November 30, 1927, of 362,000,000 gallons.

Gasoline stocks at refineries November 30, 1928, were 56,000,000 gallons less than one year previous, and constituted 29 day's supply compared with 33 days' supply November 30, 1927,—method of measuring based on daily average shipments established during 12 months ended November 30, 1928 and 1927.

Total crude oil run through refiners' stills increased 9.7 per cent during the 11 months of 1928, while gasoline production for the same period increased 13.6 per cent, the difference in these percentages being reflected in the 41.3 per cent gasoline 11 months of 1928 as compared with 39.8 per cent 11 months of 1927.

Gasoline imports were notably less in 1928 than in the 1927 period, but exports recorded the remarkable increase of 21.4 per cent, supporting the increase of 11.5 per cent in total gasoline shipments as domestic demand increased 9.5 per cent. Gasoline exports equalled 14.4 per cent of total gasoline shipments 11 months of 1928, while 13.3 per cent was the ratio 11 months of 1927.

GASOLINE STATISTICS FIRST OF YEAR TO CLOSE OF MONTH

(Quantities in thousand barrels)

1927—	Production	Shipments	Imports	Exports	Domestic Demand	Stock at Close
January	27,899	20,731	520	3,549	17,702	46,191
February	52,910	42,091	935	6,993	36,033	49,842
March	80,759	67,322	1,428	10,212	58,538	52,460
April	107,324	93,815	1,805	13,851	81,769	52,532
May	134,104	124,368	2,295	18,319	108,344	48,759
June	160,575	155,748	2,885	22,572	136,061	43,850
July	188,615	188,532	3,075	25,796	165,811	39,106
August	216,623	222,154	3,423	30,004	195,573	33,492
September	244,331	253,579	3,938	33,544	223,973	29,775
October	273,210	282,682	4,303	37,497	249,488	29,551
November	301,816	310,429	4,720	41,183	273,966	30,410
1928—						
January	27,879	24,105	562	3,713	20,954	36,112
February	54,654	48,210	934	7,054	42,090	38,782
March	83,899	76,008	1,193	11,070	66,131	40,229
April	113,231	105,359	1,665	15,181	91,843	40,210
May	144,056	139,058	2,033	21,893	119,198	37,336
June	174,731	172,676	2,245	26,701	148,220	34,393
July	207,615	209,561	2,512	31,868	180,205	30,392
August	241,652	246,793	2,991	36,431	213,353	27,197
September	275,195	281,128	3,184	41,268	243,044	26,405
October	309,514	315,399	3,572	45,317	273,654	26,453
November	342,732	345,995	3,876	49,995	299,876	29,075

PERCENTAGE CHANGES, 1928 COMPARED WITH 1927

1928—	Production Increase	Shipments Increase	Imports Decrease	Exports Increase	Domestic Demand Increase	Stocks at Close Decrease
January	*0.072%	16.275%	†8.077%	4.621%	18.371%	21.820%
February	3.296	14.538	0.107	0.872	16.810	22.190
March	3.888	12.902	16.457	8.402	12.971	23.315
April	5.504	12.305	7.756	9.602	12.320	23.456
May	7.421	11.812	11.416	19.510	10.018	23.427
June	8.816	10.869	22.184	18.293	8.936	21.567
July	10.073	11.154	18.309	23.539	8.681	22.283
August	11.554	11.091	12.621	21.420	9.091	18.796
September	12.632	10.864	19.147	23.026	8.515	11.318
October	13.288	11.574	16.988	20.855	9.686	10.484
November	13.557	11.457	17.881	21.397	9.457	4.390

*Decrease. †Increase.

WHOLESALE REDUCTIONS AT WEST COAST POINTS

LOS ANGELES, Calif., Jan. 19.—Wholesale price cutting has characterized the gasoline trade at several points on the Pacific Coast and this bid for gallonage has resulted in drastic reductions. Conditions in the Los Angeles, San Francisco and Oakland territories in California have been exceptionally unstable and, although the major companies are still maintaining a posted price for gasoline, independent service station operators are freely selling motor fuel from 5 to 6 cents per gallon under standardized quotations.

Severe price reductions have also characterized the marketing situation in the territory adjacent to Portland, Ore., and Seattle, Wash. Refiners are sitting tight as far as the differential to resellers is concerned and service station operators have been taking any loss occasioned by the orgy of price cutting which started about two weeks ago following a general weakening of several weeks' duration. It is the consensus of opinion that a number of independent service stations will be obliged to suspend operations as many resellers are taking a severe loss.

REFINERY IN SWEDEN

A shipping company has built and is now operating a refinery about 40 miles southeast of Stockholm. This is the first oil refinery to be built in northern Europe. The plant output will consist of gasoline, kerosene, fuel oil and asphalt. The products will be sold in Sweden adjacent to the refinery.

EXPECT FIVE MILLION CAR OUTPUT FOR 192

Should automobile production reach the 5,000,000-mark in 1929 predicted by several authorities in that industry, the probability of gasoline sales continuing to show the 10 to 12 per cent increase again this year appears very likely. During 1928 the total was approximately 4,650,000. "Two cars to the family" has been the slogan of several manufacturers and the rapidity with which the program is being adopted shows it justifies the high estimate for this year's production. Alvan Macauley, president of the National Automobile Chamber of Commerce, estimates there are 3,000,000 families owning two or more cars.

The export business for automobiles is also viewed optimistically for the coming year. Refiners have seen what a great factor gasoline exports have been over 1928 and the probability that substantially greater demands will come from abroad may be based on the fact automobile manufacturers are preparing for a much bigger demand. Over the last year the chamber estimated 810,000 automobiles were exported from the United States. An export movement of 1,000,000 cars a year now appears very probable.

Automobile parts are also showing a substantial increase on the export market, the total value during 1928 will closely approximate $550,000,000 the exact amount for the first 11 months being $500,673,370. This is an increase of about 30 per cent compared with the 1927 total for the same period of $390,873,304.

The exports of trucks have shown a considerable gain, the 11 months' totals for 1928 reaching $84,594,000, compared with $64,381,013 for the same time the year previous. Another vital factor in gasoline consumption abroad is the mounting number of airplanes and during the 11 months' period over 1928 the exports more than doubled compared to the year previous. The value of the planes exported in 1928 will exceed $1,700,000 while in 1927 the total approximated but $800,000.

CALIFORNIA STANDARD TO HAVE LARGEST SHIP SOON

The largest ship of a fleet belonging to the Standard Oil Co. of California is nearing completion in the shipyards at Kiel, Germany. The ship which has been named the California Standard has a cargo capacity of 130,500 bbls. and will be the largest of the California fleet. The tanker will be Diesel driven with sufficient space for fuel to cruise at full power for 100 days.

A feature, which is a departure for tankers, is provision for carrying considerable package freight in her forehold. Airy accommodations for her crew in any climate, safety devices and novel cargo handling equipment are provided.

Although she is destined to be the company's largest tanker, she also is expected to be one of its most economically operated, due to the improved designs of her internal combustion motors.

The company has 22 modern petroleum carriers, the California Standard becoming the twenty-third. Plans are held in abeyance on an additional tanker, contemplated some time ago, and to be built in American yards. This plan supplanted one of Dieselizing the District of Columbia following its purchase by the company from the United States Shipping Board more than a year ago.

Gulf Refining Company

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O&GJ 1-24-Gray

NEW LOCATIONS IN TEXAS PANHANDLE AND NORTH AND WEST TEXAS FIELDS

TEXAS PANHANDLE

Carson County

Champlin Refining Co.'s No. 2 J. W. McConnell, 330 feet south and 330 feet west of the NE cor. of the W half of NW Section 67, Block 4, I.&G.N. Survey. Prairie Oil & Gas Co.'s No. 3 J. W. McConnell-Marland, 330 feet south and 330 feet east of the NW cor. of E half of NW Section 67, Block 4, I.&G.N. Survey.

Donley County

Beaudoin and others' No. 1 W. J. Ball, 1,075 feet south and 985 feet west of the NE cor. Section 22, Block "E," D.&P. R.R. Survey.

Hutchinson County

Phillips Petroleum Co.'s No. 1 C. H. Jasper-Bret, 1,640 feet north and 2,808 feet east of the SW cor. Section 23, Block M-23, T.C.R.R. Survey.

Wheeler County

Upham Gas Co.'s No. 1 G. W. Raybo, C NW NW Section 105, Block 23, H.&G.N. Survey.

NORTH CENTRAL AND WEST TEXAS

Archer County

T. F. Hunter's No. 1 B. G. Hasson, 1,533 feet north and 1,193 feet west of the southeast corner of the south 100 acres of the B. G. Hasson 152.6-acre tract out of Section 165, Robert Carson Survey, A-105. American Refining Co. Properties and Corlett & White's No. 6 J. F. Cernosek, 450 feet north and 600 feet west of the SE cor. of W half of Section 2,409, T.E.&L. Survey. County Line Oil Co.'s No. 1 J. F. Cernosek, 150 feet north and west of the southeast corner of the east 30 acres of the north 60 acres of the south 100 acres of the J. F. Cernosek 160-acre tract out of Section 2,409, T.E.&L. Survey. Madden & Hunt's No. 14 J. T. Richardson, 150 feet north and 450 feet east of the southwest corner of the west 125 acres of the south 250 acres of the north 450 acres of Section 1, South Anderson Ranch Subdivision. J. B. Peacock's No. 1 L. C. Herron, 1,817 feet south and 450 feet east of the NW cor. Section 1,831, T.E.&L. Survey. J. B. Peacock's No. 2 G. Williams, 150 feet north and 750 feet west of the southeast corner of the J. I. Hand Survey, A-182. J. B. Peacock's No. 3 Mrs. G. Williams, 150 feet north and 1,350 feet west of the southeast corner of the J. I. Hand Survey, A-182. Perkins & Cullum's No. 2 Mrs. G. Williams, 150 feet north and 1,650 feet west of the southeast corner of the north 40 acres of the south 80 acres of the J. I. Hand Survey, A-182. The Texas Company and Clayton's No. 1 B. V. Engle, 784 feet north and 175 feet east of the SW cor. of Section 104, Club Ranch Subdivision.

Brown County

J. D. Burris and others' No. 11 J. Newton, 1,050 feet north and 150 feet west of the southeast corner of the J. Newton 158.5-acre tract out of the P. Curlong Survey No. 151. Humble Oil & Refining Co.'s No. 9 Hamp Byler, 150 feet north and 872 feet west of the southeast corner of their 80-acre lease out of the T.&N.O. Survey, No. 43. Same company's No. 18 J. T. Hodnett-A, 572 feet north and 600 feet east of the southwest corner of their 160-acre "A" lease out of the Hrs. J. M. Harris Survey No. 784. Independent Oil & Gas Co.'s No. 1 Mrs. T. S. Williams, 330 feet north and east of the southwest corner of the east 60 acres of the J. R. Rushing Survey, A-1,296. J. A. McCartney's No. 1 M. J. Suttles, 1,350 feet south and 1,967 feet west of the northeast corner of the Robbert Mitchell Survey No. 140. Midsun Oil Corp. and Brennan's No. 1 M. W. Bull, 450 feet south and 150 feet east of the northwest corner of the M. W. Bull 115-acre tract out of the R. Honeycutt Survey No. 623. Pandem Oil Corp.'s No. 12 R. L. Westerman, 450 feet south and west of the northeast corner of their lease out of the Hrs. N. B. Mitchell Survey No. 150. Prairie Oil & Gas Co.'s No. 5 Mrs. A. Armstrong, 450 feet north and east of the southwest corner of the east 380 acres of the H.&G.N. Survey No. 1. Same company's No. 1 C.H.&A.J. Reaves, 150 feet north and 1,225 feet west of the southeast corner of the Thomas Belknap Survey No. 633. Young Brothers, Alexander & Woodley Petroleum Co.'s No. 19 Roy Hickman, 120 feet south and 750 feet east of the northwest corner of their 80-acre lease out of the Thomas Benson Survey No. 783. Amerada Petroleum Corp.'s No. 2 Mrs. W. R. Guthrie, 5,207 feet northeast of the southwest line and 2,203 feet southeast of the northwest line of the Mrs. W. R. Guthrie 707-acre tract out of the A. Arrocha Survey, A-205. H. P. Evans' No. 1 A. G. Norton, 450 feet north and west of the SE cor. of the N half of the NW Section 11, H.T.&B. (shown as K. & R. Stumpp). Gore & Brown's No. 1 Will H. Mayes, 186 feet south and 420 feet west of the northeast corner of the J. M. Ross Survey No. 609. Same company's No. 2 W. H. Mayes, 543 feet south and 416 feet west of the northeast corner of the J. M. Ross Survey No. 609. Harry Gutzman's No. 8 L. J. Stanley, 1,650 feet east of the Fort Worth & Rio Grande right-of-way and 450 feet north of the south line of the L. J. Stanley 320-acre tract out of the Hrs. W. A. Smith Survey No. 139. Humble Oil & Refining Co.'s No. 1 Mrs. M. C. Fuller, 950 feet south and 150 feet east of the northwest corner of the Mrs. M. C. Fuller 428-acre tract out of the G. B. Jennings Survey No. 353. Lloyd Oil Corp.'s No. 13 J. C. Collier, 390 feet east of the Ft.W.&R.G. right-of-way and 135 feet south of the north line of the J. C. Collier 320-acre tract out of the Mrs. W. A. Smith Survey No. 139. Same corporation's No. 14 J. C. Collier, 390 feet east of the Ft.W.&R.G. right-of-way and 435 feet south of the north line of the J. C. Collier 320-acre tract out of the Hrs. W. A. Smith Survey No. 139. Paramount Oil Royalty Co.'s No. 2 Will H. Mayes, 900 feet north and 750 feet west of the southeast corner of the Will H. Mayes 255-acre tract out of the J. M. Ross Survey No. 609.

Callahan County

Beddingfield & Connor's No. 5 J. C. McDermitt, 300 feet south and 450 feet west of the NE cor. of Section 45, Comal County School Land. Bradstreet & Holden's No. 1 J. L. Cavanaugh, 450 feet south and 200 feet east of the NW cor. of the E half of Section 98, Comal County School Land. Same company's No. 11 J. A. Miller, 2,317 feet north and 350 feet east of the SW cor. Section 98, Comal County School Land. E. W. M. O. Oil Corp.'s No. 1 J. C. Jones, 150 feet north and east of the southwest corner of the northeast of the J. C. Jones tract out of Section 40, Deaf and Dumb Asylum Land. Holmes and others' No. 1 A. Hickman-A, 450 feet south and west of the NW cor. of Section 32, and located in Section 31, Deaf and Dumb Asylum Land. H. E. Hurley and others' No. 1 J. Freeman, 450 feet north and 150 feet west of the southeast corner of the north 80 acres of Section 60, Comal County School Land. W. R. Mack's No. 1 R. L. Griggs, 450 feet north and 1,350 feet east of the SW cor. Section 122, B.B.B.&C. Survey. The Texas Company's No. 14 P. G. Hatchett, 1,067 feet south and 150 feet east of the NW cor. of the NE of the NW of Section 29, Deaf and Dumb Asylum Land. Same company's No. 15 P. G. Hatchett, 152 feet north and 419 feet east of the SW cor. of the NE of the NW of Section 29, Deaf and Dumb Asylum Land. Same company's No. 16 P. G. Hatchett, 150 feet south and west of the NE cor. of the SW of the NW of Section 29, Deaf and Dumb Asylum Land. J. B. Weigel and others' No. 1 Linville heirs, 150 feet north and east of the southwest corner of the Linville heirs tract out of the W. G. Anderson Survey No. 777.

Clay County

American Refining Co. Properties No. 1 American Refining Co. Properties, 150 feet south and east of the NW cor. of Section 60, Bacon Subdivision out of the W. Weddington Survey, A-998. A. C.

Camp and others' No. 1 J. F. Johnston. 150 feet north and west of the southeast corner of the south 80 acres of the north 118.62 acres of the east 138.62 acres of the J. F. Johnston 238-acre tract out of the K. McKenzie Survey, A-328.

Coleman County

Gwinnup and others' No. 1 J. W. Gates, 212.5 feet north and 450 feet west of the most westerly southwest corner of the G. W. J. Johnson 120-acre tract and on the J. W. Gates 274-5-acre tract out of the Manuel Chavez Survey No. 44. S. B. Owens' No. 1 W. T. Burns, 1,623 feet north and 150 feet east of the northeast corner of the O. Burton 100-acre tract and located on the W. T. Burns 920-acre tract out of the Asa Wickson Survey No. 168. Brooks Dozier's No. 1 T. A. Sears, 150 feet north and east of the southwest corner of the north 100 acres of the Charles Shanks Survey No. 243. J. E. Dunaway and others' No. 1 W. E. Baugh, 150 feet north and 767 feet west of the southeast corner of the east 100 acres of the Upton Henderson 1,089.9-acre tract out of the P. Young Survey No. 494. Forster Brothers' No. 1 W. C. Sharp, 1,050 feet north and 5,100 feet west of the SE cor. of Section 91, Bonds & Sanders Survey, being 1,050 feet north and 150 feet east of the southwest corner of the W. C. Sharp 195-acre tract. Humphrey Brothers and others' No. 4 J. P. Mathews, 750 feet north and 450 feet west of the southeast corner of the C. Raquet Survey No. 43. Midwest Exploration Co.'s No. 2 E. W. Gill, 3,700 feet north and 1,250 feet west of the southwest corner of the W. J. Cannon Survey No. 69, A-128, and located in the E. Mudd Survey No. 69, being 310 feet north and 1,025 feet east of the southwest corner of the E. W. Gill 99-acre tract. Simons-Jones and others' No. 1 A. G. Mills, 150 feet south and east of the northwest corner of the east 50 acres of Lot 23, John Martin Survey No. 752. The Texas Company's No. 1 C. B. Beatty, 150 feet south and 1,750 feet east of the northwest corner of the east 132.5 acres of the south 265 acres of the north 565 acres of the Bonds & Sanders Survey No. 93. Texas Pacific Coal & Oil Co.'s No. 1 R. C. Gay, 150 feet south and west of the northeast corner of the R. C. Gay 200-acre tract out of the Mary Ann Fisk Survey No. 630.

Cooke County

Bridwell Oil Co.'s No. 2 A. J. Dennis, 1,680 feet south and 1,220 feet west of the northwest corner of the J. L. Stephens Survey, A-1,001, and located in the H. Wilkerson Survey, A-1,173. Thornton-Taubert Oil Co.'s No. 2 A. J. Dennis, 1,900 feet north and 303 feet west of the southeast corner of the H. Wilkerson Survey, A-1,173.

Crockett County

Lewis & Daniels' No. 1 Pecos River Bed, south 37 degrees east 53 feet from the NW cor. of Section 33, Block 1, I.&G.N. Survey and located in the Pecos River Bed.

Eastland County

T. J. Alworth and others' No. 2 V. Harbin, 450 feet north and 1,250 feet east of the SW cor. of the NW of Section 4, Block 4, H.&T.C. Survey. J. Hamon, Jr.'s No. 14 W. G. Poteet, 294 feet south and 1,054 feet east of the NW cor. of the SW of Section 4, Block 4, H.&T.C. Survey. Mook-Texas Oil Co.'s No. 1 H. L. Parker, 490 feet north and 1,000 feet west of the southeast corner of Lot 16, W. Van Norman Survey. Belva Oil Co.'s No. 6 F. Good, 1,610 feet north and 300 feet west of the southeast corner of the F. Good tract out of the J. R. Stubblefield Survey. G. P. Mitcham's No. 1 T. Weddington, 150 feet north and east of the SW cor. of the NE of Section 86, Block 3, H.&T.C. Survey. Southern Oil & Production Co.'s No. 1 A. L. Thorp, 525 feet south and 1,040 feet east of the NW cor. of the W half of the SE of Section 456, S.P.R.R. Survey.

Erath County

Culbertson Brothers and others' No. 1 W. G. Fulbright, 650 feet south and east of the northwest corner of the W. A. Holland Survey, A-372. Hickory Oil & Gas Co.'s No. 1 A. N. Gordon, 1,000 feet south and 500 feet west of the northeast corner of the A. N. Gordon 50-acre tract out of the J. M. Espinosa Survey. Same company's No. 1 T. J. Mauldin, 4,500 feet south and 6,100 feet east of the northwest corner of the J. M. Espinosa Survey, being 500 feet north and 460 feet west of the southeast corner of their 80-acre lease.

Fisher County

Cranfill & Reynolds' No. 1 J. R. Fleming, 1,980 feet south and 2,310 feet east of the NW cor. of Section 207, B.B.B.&C. Survey. Same company's No. 2 B. F. Willingham, 1,980 feet south and 2,310 feet west of the NE cor. of Section 207, B.B.B.&C. Survey. Landreth Production Corp.'s No. 1 T. B. Cooper, 440 feet south and west of the NE cor. of the NW of Section 115, Block 1, H.&T.C. Survey. The Texas Company and Phillips Petroleum Co.'s No. 1 W. H. Hall, 330 feet north and west of the SE cor. of Section 6, Block 20, T.&P. Survey.

Howard County

Bristow & Merrick's No. 8 Dora Roberts, 990 feet north and 330 feet east of the SW cor. of Section 137, Block 29, W.&N.W. Survey. Gulf Production Co.'s No. 5 H. R. Clay, 990 feet south and 330 feet west of the northeast corner of its 320-acre lease out of Section 155, Block 29, W.&N.W.R.R. Survey. Empire Gas & Fuel Co.'s No. 2 H. R. Clay, 785 feet north and 1,570 feet west of the SE cor. of Section 127, Block 29, W.&N.W.R.R. Survey. Empire Gas & Fuel Co.'s No. 2 H. R. Clay, 785 feet north and 1,570 feet west of the SE cor. of Section 127, Block 29, W.&N.W.R.R. Survey. Green River Oil & Refining Co.'s No. 6 H. R. Clay, 1,315 feet north and 1,070 feet west of the SE cor. of Section 127, Block 29, W.&N.W.R.R. Survey. Hyer & Yates' No. 3 H. R. Clay, 990 feet south and 2,310 feet west of the NE cor. of Section 155, Block 29, W.&N.W.R.R. Survey. Laurel Oil & Gas Co. and Cosden & Co.'s No. 10 Dora Roberts, 990 feet north and 330 feet west of the SE cor. of Section 136, Block 29, W.&N.W.R.R. Survey.

Irion County

Mertzon Interests' No. 1 Harlan Horney, 2,440 feet south and 150 feet east of the NW cor. of Section 2, Block 3, H.&T.C. Survey.

Jack County

Bryson Oil & Gas Co.'s No. 1 J. M. Box, 150 feet south and east of the northwest corner of the J. M. Box Survey, A-2,054.

Jones County

Cosden & Co. and others' No. 1 E. C. Brown, 200 feet north and 300 feet west of the southeast corner of the J. H. Grayson Survey No. 4, A-1,772. Grisham-Hunter Corp.'s No. 1 J. W. Tiner, 311 feet north and 330 feet west of the southeast corner of the Gabriel Zumwalt Survey No. 279. Phillips Petroleum Co.'s No. 3 H. B. Vestal, 330 feet north and 990 feet west of the southeast corner of the H. B. Vestal 270-acre tract out of Section 18, Block 19, T.&P. Survey. Same company's No. 2 R. E. Windham, 330 feet north and 980 feet west of the southeast corner of the R. E. Windham 120-acre tract out of Section 17, Block 19, T.P.R.R. Survey. Same company's No. 3 R. E. Windham, 950 feet north and 330 feet west of the southeast corner of the R. E. Windham 120-acre tract out of Section 17, Block 19, T.&P. Survey. Same company's No. 6 Joe Winters, 994 feet north and 1,639 feet east of the SW cor. of the N half of Section 19, Block 19, T.&P. Survey.

Mills County

J. E. Whiteside and others' No. 1 Z. Traylor, 150 feet north and east of the SW cor. of the NE of Section 6, H.T.&B. Survey.

Mitchell County

Magnolia Petroleum Co.'s No. 6 Mary Foster, 1,980 feet north and east of the SW cor. of Section 17, Block 29, Township 1s, T.&P. Survey.

Pecos County

M. H. Black's No. 1 Pecos Valley Oil Co., 2,310 feet northwest of the southeast line and 1,650 feet northeast of the southwest line of Section 22, Block 10, H.&G.N. Survey. Gulf Production Co.'s No. 14 M. A. Smith and others, Tract B, 330 feet south and 990 feet west of the NE cor. of the S half of Section 22, Block 194, G.C.&S.F.R.R. Survey. Same company's No. 15 M. A. Smith and others.

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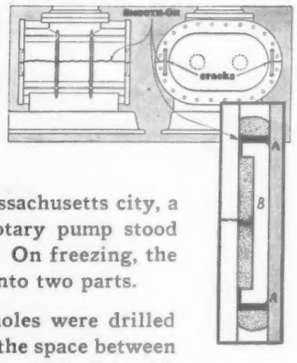

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1-24-29

Tract B, 1,040 feet south and 2,496 feet west of the NE cor. of Section 22, Block 194, G.C.&S.F.R.R. Survey. McCarty Oil Co.'s No. 1 A. A. Gray, 1,520 feet north and 150 feet east of the SW cor. of Section 591, G.C.&S.F., Survey, A-3,-010.

Montague County

Continental Oil Co.'s No. 5 W. W. Jones-A, 1,504 feet north and 1,000 feet west of the southeast corner of their 100-acre lease "A" out of the William Donohoo Survey, A-178. Pure Oil Co.'s No. 6 J. W. Maddox-D, 200 feet north and east of the southwest corner of their 91-acre lease "D" out of the J. Chambliss Survey, A-123.

Shackelford County

Cranfill & Reynolds' No. 1 C. Flippin-C, 150 feet south and west of the NE cor. of the S half of the N half of the NE of Section 34, Block 11, T.&P. Survey. Same company's No. 2 C. Flippin-C, 150 feet south and 450 feet west of the NE cor. of the S half of the N half of the NE of Section 34, Block 11, T.&P. Survey. Ohio-Texas Oil Co.'s No. 11 J. B. Matthews, 820 feet south and 150 feet east of the NW cor. of the SW of the NW of Section 29, Block 10, E.T.R.R. Survey. Roeser & Pendleton's No. 33 W. I. Cook-A, Section 61, 1,939 feet north and 1,396 feet west of the SE corner of the SE of Section 61, Block 10, E.T.R.R. Survey. Same company's No. 9 W. I. Cook-B, Section 61, 620 feet south and 560 feet west of the NE cor. of the SW of the SW of Section 61, Block 10, E.T.R.R. Survey. E. R. Tennant and others' No. 1 J. B. Matthews, 1,020 feet north and 1,110 feet east of the SW cor. of Section 5, Block 10, E.T.R.R. Survey.

Stephens County

Mid-Tex Oil Co.'s No. 8 W. W. Cunningham, 500 feet south and 2,600 feet west of the northeast corner of their lease out of Section 1,210, T.E.&L. Survey. W. W. McDonald's No. 1 J. A. Langford, 150 feet north and west of the SE cor. of the NE of Section 54, Block 6, T.&P. Survey. O. F. Striplin's No. 1 D. W. Redwine, 330 feet south and west of the northeast corner of the south 80 acres of the NE of Section 38, Block 6, T.&P.R.R. Survey. Swensondale Petroleum Corp.'s No. 34 P. Swenson, 2,-000 feet north and 2,200 feet west of the SE cor. of Section 5, Orphan Asylum Land.

Wichita County

Comac Drilling Co.'s No. 1 Lillis Morgan, 2,550 feet north and 1,200 feet west of the southeast corner of the L. Meadows Survey, A-808. C. A. Everts' No. 2 P. M. Myers, 1,000 feet south and 150 feet east of the most easterly northeast corner of the C. Winters Survey, A-322, and located in Section 4, Red River Valley Lands. Magnolia Petroleum Co.'s No. 141, H. Reilly, 1,600 feet north and 3,-550 feet east of the most westerly southwest corner of the L. C. Dennison Survey, A-55. Whittaker & Hamilton's No. 1 M. J. Gardner, 600 feet southeast of the northwest line and 450 feet northeast of the southwest line of Section 17, Knott Brothers Subdivision, Jonas English Survey, A-71. C. B. Bailey's No. 29 S. I. & H. M. Munger, 1,950 feet north and 575 feet east of the southwest corner of Block 30, Kemp Wichita Valley Land. W. H. Hammon's No. 12 S. H. McCarty-A, 150 feet south and east of the northwest corner of the W. R. Eaves Survey, A-447. Humble Oil & Refining Co.'s No. 8 W. H. Taylor, 453 feet south and 150 feet west of the northeast corner of Block 81, Kemp Wichita Valley Land. Same company's No. 9 W. H. Taylor, 150 feet south and 450 feet west of the northeast corner of Block 81, Kemp Wichita Valley Lands. Same company's No. 1 S. W. Wigley, 1,750 feet south and 750 feet east of the northwest corner of the S. W. Wigley 160-acre tract out of the P. Castleman Survey, A-36.

J. T. Lobbin and others' No. 1 H. B. Hines, 2,000 feet north and 800 feet east of the SW cor. of Section 11, H.&G.N. Survey, A-147. Same company's No. 2 H. B. Hines, 1,594 feet north and 800 feet east of the SW cor. of Section 11, H.&G.N. Survey, A-147. Same company's No. 3 H. B. Hines, 2,300 feet north and 1,100 feet east of the SW cor. of Section 11, H.&G.N. Survey, A-147. United Producers Co.'s No. 2 Allen & Kemp, 150 feet north and 450 feet west of the southeast corner of Block 44, Kemp Wichita Valley Lands.

Wilbarger County

Barkley & Meadows' No. 6 W. T. Waggoner-A, 465 feet north and 485 feet west of the SE cor. of the SE of the SW of Section 24, Block 4, H.&T.C. Survey. C. P. Burton's No. 1 W. T. Waggoner-B, 150 feet north and 2,490 feet west of the NW cor. of Section 5, Block 5, H.&T.C. Survey, and located in the Thomas D. Purnell Survey. Easter Oil Co.'s No. 2 W. T. Waggoner-B, 205 feet north and 660 feet west of the SE cor. of the N half of the NW of Section 39, M.E.P.&P. Survey.

Fain-McGaha Oil Corp.'s No. 31 W. T. Waggoner-S, 205 feet north and 550 feet west of the SE cor. of the NW of Section 24, Block 4, H.&T.C. Survey. C. F. Kolp's No. 2 W. T. Waggoner-G, 150 feet north and 490 feet east of the SW cor. of the N half of the SE of the NE of Section 18, Block 4, H.&T.C. Survey. Phillips Petroleum Co.'s No. 8 W. T. Waggoner-Q, 330 feet south and east of the NW cor. of the SE of the SE of Section 47, Block 2, H.&T.C. Survey. Same company's No. 2 W. T. Waggoner-RR, 467 feet north and 300 feet east of the SW cor. of the SE of the NE of Section 44, Block 4, H.&T.C. Survey.

Shaw Oil Co.'s No. 3 W. T. Waggoner-E, 150 feet south and 490 feet east of the NW cor. of the S half of the SE of the NE of Section 18, Block 4, H.& T.C. Survey. Staley-Wynne & Co.'s No. 1 W. T. Waggoner-K, 1,170 feet north and 150 feet east of the SW cor. of Section 1, S.P.R.R. Survey.

Winkler County

Atlantic Oil Producing Co.'s No. 4 Ida Hendricks, 2,310 feet south and west of the NE cor. of Section 44, Block 26, School Land. Humble Oil & Refining Co.'s No. 8 T. G. Hendricks-B, 440 feet north and 1,320 feet east of the SW cor. of Section 39, Block 26, School Land. Independent Oil & Gas Co.'s No. 3 Ida Hendricks-B, 2,310 feet north and west of the SE cor. of Section 44, Block 26, School Land. Pure Oil Co.'s No. 1 Ida Hendricks, 2,310 feet north and east of the SW cor. of Section 44, Block 26, School Land.

Young County

P. F. Gwynn's No. 3 H. D. Kunkel-C, 350 feet north and 150 feet east of the southwest corner of the south 14 acres of the west 25 acres of the north 50 acres of the east 100 acres of the H. D. Kunkel 160-acre tract out of Section 4, B.B. B.&C. Survey. Holbrook & Wood's No. 3 S. E. Watson-A, 150 feet south and 750 feet west of the NE cor. of the SE of Section 22, Young County School Land, A-1,284. Petroleum Producers Co.'s No. 5 L. Parrish-A, 150 feet south and 450 feet west of the northeast corner of their "A" lease out of Section 408, T.E.&L. Survey.

Corrected Locations

Archer County—The Texas Company's No. 23 R. E. Hill, 150 feet south and 2,578 feet west of the NE cor. of Section 2,408, T.E.&L. Survey.

Fisher County—Cranfill & Reynolds' No. 1 M. M. Brown, 200 feet south and 450 feet east of the NW cor. of Section 4, Block "R," W. E. Richardson Survey.

Jones County—Independent Oil & Gas Co.'s No. 3 A. T. Smith, 330 feet north and 971 feet east of the southwest corner of their 59-acre lease out of Section 51, Block 18, T.&P. Survey. Midsun Oil Corp.'s No. 1 G. Hoehn, 1,589 feet south and 821 feet west of the northeast corner of the G. Hoehn 1,001.3-acre tract out of the A. Crain Survey, A-152. Snowden & McSweeney's No. 5 C. A. Bickley, 330 feet south and 971 feet east of the NW cor. of the N half of the NW of Section 50, Block 18, T.&P. Survey. E. P. Campbell and others' No. 1 Charles Herndon, 1,320 feet north and 660 feet east of the SW cor. of Section 6, M.E.P. &P. Survey.

Palo Pinto County—Atlantic Oil Producing Co.'s No. 1 J. N. Stuart, 150 feet north and west of the SE cor. of the N

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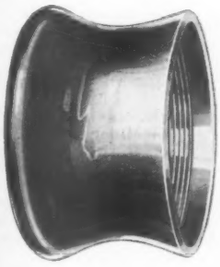

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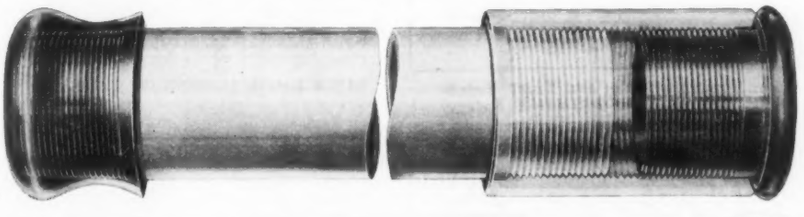

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GAS ANALYSES IN PLANT OPERATION

(Continued from Page 151)

1926,) by Walter J. Podbielniak under the direction of Prof. E. H. Leslie, the investigation being in part financed by the Phillips Petroleum Co. of Bartlesville, Okla. An apparatus and methods of analysis were developed using the principle of fractional distillation in an efficient column, preferably at atmospheric pressure, for the separation of the hydrocarbons in natural gas or natural gasoline from methane to hexane inclusive in a single distillation, the percentages of the hydrocarbons being determined directly from the fractional distillation curve plotted for the temperature of the overhead vapor from the column against the amount of distillate.

As then developed, the apparatus was found fairly satisfactory and is now being used as a standard analytical method for the analysis of natural gas and gasoline in the laboratories of the Phillips Petroleum Co. since July, 1926, as is discussed in an article by Oberfell and Alden of the above company published in "The Oil and Gas Journal," October 18, 1928.

References should also be made to an analytical apparatus for natural gas as developed and used by the Chemical Engineering Department of the Massachusetts Institute of Technology and described in a Journal of Industrial Engineering Chemistry. There has also been published an article by Oberfell, Gregory and Legatski, under the title "High Pressure Fractionation Method," which describes an apparatus constructed of iron to operate under high pressure. It is applicable only to gasoline and intended primarily to separate gasoline in fractions which may be used for further study.

Gas and Gasoline Sampling

The question of sampling is of paramount importance wherever analyses are made and especially so for natural gas and gasoline, the compositions of these varying from moment to moment in even the most steadily operating natural gasoline plant, and subject to material change by the slightest change in pressure or temperature or by contamination. The natural gasoline industry is based on the extraction of only a few per cent of gasoline vapor in the wet gas entering a plant, and the requirement for accuracy in analysis and the utmost care in sampling is particularly severe.

Experience has shown that most erratic results are traceable to improper sampling rather than to errors in analysis. Analytical results, no matter how accurate, are of course worse than useless if the samples be not representative. The precautions to be taken in sampling and the considerations involved are discussed in a paper by L. O. Warner of the firm of Barton, Manning & Warner, the title being "The Importance of Obtaining Representative Samples of Gas and Gasoline for Analysis," presented at a meeting of the California Natural Gasoline Association.

Application of Results

Wet Gas Analysis: The fundamental analysis of a wet gas sample is a statement of what is actually in the gas in terms of the individual hydrocarbons which remain unchanged in their passage through a natural gasoline plant. Whatever propane or other hydrocarbon is determined in the inlet gas must be accounted for in the outlet gases and liquids from the plant. As the physical constants of the hydrocarbons occurring in natural gas are known with considerable accuracy, it is possible to calculate from the analysis of a wet gas its specific gravity, heating value, and the liquid equivalents of the separate hydrocarbons, that is, the G.P.M.'s of propane, is-butane, n-butane and pentanes-and-heavier by a very simple computation. It follows, therefore, that the absolute potential production of any given hydrocarbon or of a specified mixture of these hydrocarbons, such as a 30 per cent n-butane gasoline product containing all the pentanes-and-heavier available, can be calculated from the analysis of a wet gas.

The necessity for specifying the composition of a gasoline product to be made is evident when we consider the fact that it is rarely possible to extract all of the butanes in a natural gas and still obtain a 90 per cent A.S.T.M. recovery product even though no propane is retained in it. Butanes are, therefore, almost always present in the plant discharge gases. The relation between the composition of gasoline and its A.S.T.M. recovery has been investigated by J. C. Burks of the O. C. Field Gasoline Corp. and his findings described in a paper under the title "Practical Application of Gas and Gasoline Analysis as Applied to Plant Control," read before a meeting of the California Natural Gasoline Association. The results of this investigation are of considerable aid in computing potential production of gasoline from wet gas analysis to meet various specifications.

Having the wet gas analysis and assuming the composition of the finished gasoline product, it is possible to calculate necessary absorber and still capacities, required oil circulation and to design a stabilizer to properly balance separation efficiency, resulting in increased production against the increased investment for a more efficient stabilizer.

The question immediately occurs as to how the charcoal test compares in results with fundamental analysis. The charcoal test apparently has never been thoroughly investigated as regards the changes in composition occurring in natural gas passing through charcoal, and the re-

TABLE 2—CALCULATION OF VAPOR PRESSURE OF GASOLINE FROM ANALYSIS

Hydrocarbon—	% Liq. vol.	Sp.Gr. 60°F.	Grams	Mol. wt.	Mols	Mol. frac.	V.P. 60°F.	P.V.P.	% in vapor	Wt. % in liq.
Propane	2.1	.515	1.082	44.06	.02456	.02812	107.1	3.01	17.8	1.7
Iso-butane	8.3	.562	4.665	58.08	.08302	.09196	38.7	3.56	21.1	7.6
N-butane	25.0	.581	14.525	58.08	.25009	.28632	26.3	7.53	44.5	23.5
Iso-pentane	6.3	.625	3.938	72.10	.05462	.06253	9.46	.59	3.5	6.3
N-pentane	24.1	.632	15.231	72.10	.21125	.24185	6.99	1.69	10.0	24.4
Dilsopropyl	6.2	.666	4.129	86.11	.04795	.05490	3.07	.17	1.0	6.6
Iso-hexane	8.6	.666	5.728	86.11	.06652	.07616	2.00	.15	.9	9.2
N-hexane	12.0	.663	7.956	86.11	.09239	.10577	1.85	.20	1.2	13.7
Residue	7.4	.706	5.224	114.14	.04577	.05240	.15	.008	.04	5.4
Total	100.0		62.478		.87437	1.00000		16.91	100.00	100.0

The specific gravity is calculated to be .625 (dividing grams total by 100 cc.).

TABLE 3—PLANT SURVEY NO. 1

INTO PLANT		
Wet gas		2,841 M. cu. ft.
OUT OF PLANT		
Total dry gas		2,644 M. cu. ft.
Gasoline produced		2,604 gallons
Analytical Results and Plant Material Balance	G.P.M.	GALLONS
Gasoline content of wet gas, taken equal to normal butane and heavier	1.14	3,239
Gasoline content of dry gas, taken to equal normal butane and heavier	0.27	714
Indicated net production from gas analysis		2,525
Actual plant production		2,604
Difference		79
Per cent excess of actual over calculated potential production from analysis, based on n-butane and heavier of wet and dry gas		3.13

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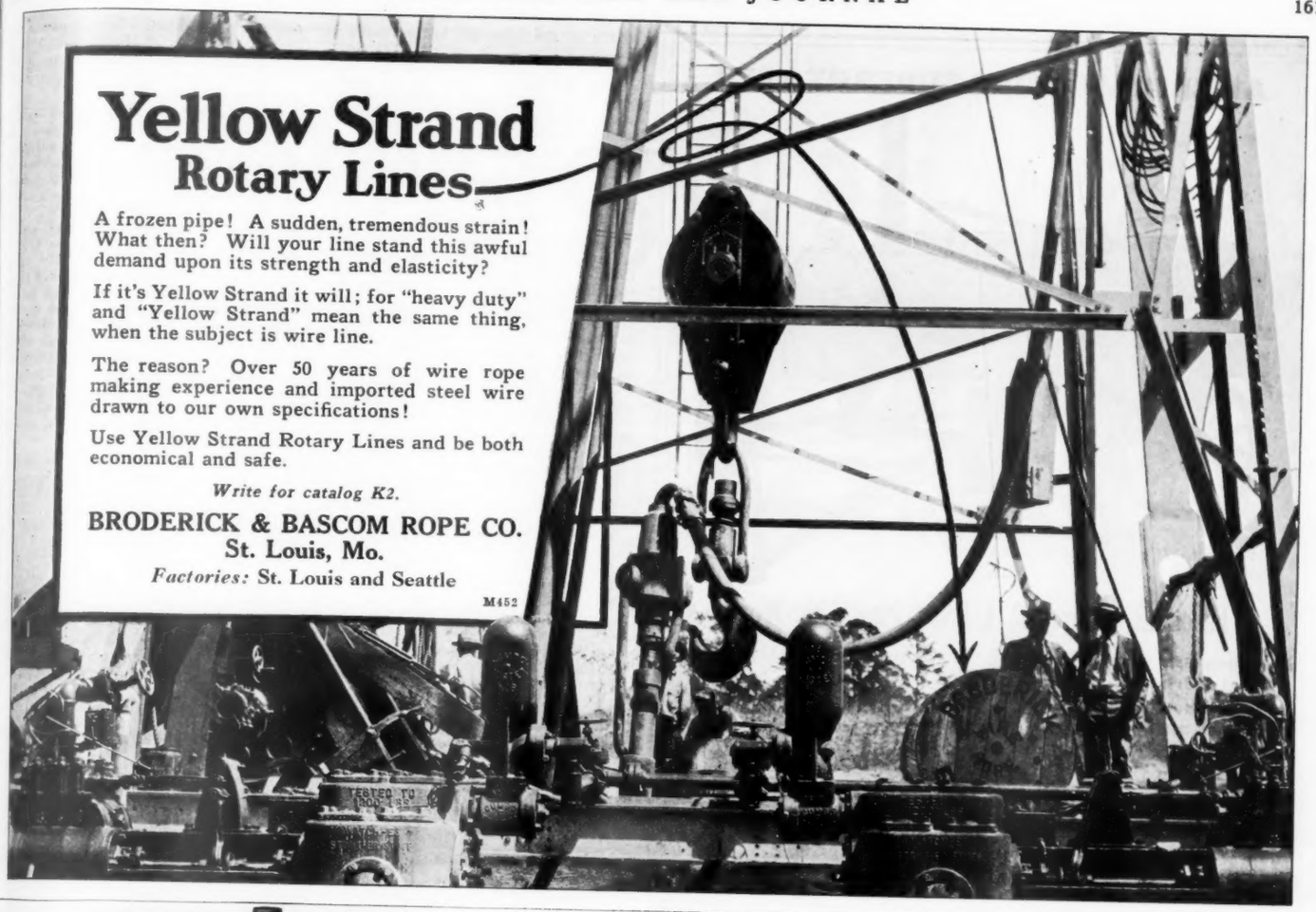

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covery of the adsorbed hydrocarbons in the distillation of the enriched charcoal.

Table 1 compares iso-butane and heavier G.P.M. as calculated from fundamental analysis, with G.P.M.'s as obtained by the 30-pound 32 degrees Fahrenheit charcoal test.

While the charcoal test can be used to obtain absolute results as above, it cannot furnish more information on the compositoin of a gas than shown.

Dry Gas Analysis

The analysis of discharge gases from a plant, such as absorber discharge, fractionator overhead, accumulator vent gas, etc., indicates the point at which losses of recoverable gasoline occur and the amount of these losses. This is more satisfactory than checking actual gasoline production against potential production as determined from wet gas analysis, as in the latter case, all the errors of gas or gasoline volume measurement and of the sampling contribute to render the material balance inaccurate. Once the source of loss is located, it is usually a simple matter to remedy this loss by changing operating conditions, the flow-sheet of the plant or by modifying or replacing equipment.

Gasoline Analysis: The analysis of the gasoline product yields much valuable information. It is well recognized that since n-butane has a decidedly lower vapor pressure than iso-butane or propane, it is possible to incorporate much more n-butane than iso-butane or the still more volatile propane to meet a recovery or vapor pressure specification, with corresponding increase in production. The function of a stabilizer is to separate the propane and part of the iso-butane in a raw gasoline efficiently and economically to yield maximum production of specification finished product.

It is not possible to check up on the performance of a stabilizer without an analysis involving more nearly quantitative separation of the hydrocarbons in gasoline than the stabilizer itself accomplishes, and this is where all empirical tests fail. It is entirely possible for the stabilizer to be inoperative and simply weathering raw gasoline down to specifications without detection by the usual volume measurements and empirical tests. There is need for some yardstick to tell just when a stabilizer is "up to snuff," and when it is not. Such a yardstick is furnished by fundamental analysis which determines the n-butane and pentanes-and-heavier escaping in the stabilizer vent gas and the propane and iso-butane retained in the product, and thus quantitatively determines the separation accomplished in the stabilizer.

If the analysis of a gasoline sample is carried through pentanes, the vapor pressure of the gasoline may be calculated fairly closely using Raoult's law. If the analysis is carried through hexanes, the calculated vapor pressure will be correct within about 2 per cent to 3 per cent (not taking into account dissolved air and other gases). Table 2, illustrates the method of computing from liquid analysis the weight per cents, the mol fractions and the partial vapor pressures of the individual hydrocarbons and the sum of the partial vapor pressure yielding calculated

TABLE 4—PLANT SURVEY REPORT No. 2

Inlet

Constituent	Inlet Gas Ave. of 3 Analyses	Gallons /M Computed	Gallons /M By Tests	Total Cu. Ft. Computed from Analyses and Meter Reading	Gals. Computed
Methane	76.93			3,377,227	
Ethane	9.15			401,685	
Propane	7.38		Total 3.99	323,982	
Butanes	4.01	1.26	Ice-Alc. 2.51	176,039	5,553
Pentane and Heavier (Actual)	3.31	1.36	Ice 1.79	145,309	5,955
			B-Charcoal 30-lb.-32° [illegible] 1.74		
Total	100.72	2.62		4,424,242	11,508
Metered	100.00			4,390,000	

Gasoline Production (Gauge)

Quantity	7,554 Gal.
Gravity	823° A.P.I.
Init. B. P.	69° F.
Endpoint	316° F.
Recovery	89.3%

Discharge

Constituent	Disch. Gas Ave. of 2 Analyses	Gallons /M Computed	Gallons /M By Tests	Total Cu. Ft. Computed from Analyses and Meter Reading	Gals. Computed	Difference (Inlet Less Discharge) Cu. Ft.	Gals.
Methane	80.92		A-CO_2 Test	3,301,536		75,691	
Ethane	9.54		Total 3.95	389,232		12,453	
Propane	7.46		Ice-Alc. 0.74	304,368		19,614	530
Butanes	2.28	0.72	Ice 0.35	93,024	2.935	83,015	2,619
Pentane & Heavier (Actual)	.46	0.17	B-Charcoal 30-lb. 32° 32° 0.88	18,768	677	126,541	5,186
Total	100.66	0.89		4,106,928	3,612	317,314	8,335
Metered	100.00			4,080,000			10.5% High

TABLE 5—STABILIZER SURVEY (LOW PRESSURE TYPE)

VOLUMES—

Feed to Stabilizer	16,250 Gals./24 Hrs.
Reflux to top of column	40,000 Gals./24 Hrs.
Vent gas from column	1,030 MCF/24 Hrs.
Kettle Product from column	21,919 Gals./24 Hrs.

OTHER TEST DATA—

Feed: From accumulator held at 20-lb. gauge pressure and 77° F.
A.P.I Gravity of feed — 88.0° at 60° F.
I.C.C. vapor pressure — 40.6 lbs. per sq. in. absolute at 100° F.
Beistle-Prather vapor pressure — 44.1-lbs. per sq. in. absolute at 100° F.

Reflux: From accumulator held at 175-lbs. per sq. in. gauge pressure and 82° F; injected at top of stabilizer.

Vent Gas: Temperature at top of column was —12° F.

Kettle Product: Kettle temperature was 57° F. and kettle pressure was 3.5 lbs. sq. in. gauge.

	Lbs. Sq. In. Abs.
Calculated vapor pressure at 100° F.	36.6
I.C.C. vapor pressure at 100. F.	33.3
Beistle-Prather pressure at 100° F.	34.8

STABILIZER SURVEY (LOW PRESSURE TYPE), ANALYTICAL RESULTS AND MATERIAL BALANCE ANALYSES

	Feed %Liq. Vol.	Feed Gals. 24 Hrs.	Reflux %Liq. Vol.	Reflux Gals. 24 Hrs.	Reflux Cu. Ft. 24 Hrs.	Vent Gas %Gas Vol.	Vent Gas Cu. Ft. 24 Hrs.	Vent Gas Gals 24 Hrs.	Ket.Pro. %Liq. Vol.	Ket.Pro. Gals. 24 Hrs.
Methane	.....	.....	0.5	200	16,120	1.3	13,380	.....	.....	.....
Ethane	.....	.....	3.7	1,480	69,200	7.9	81,100	.....	.....	.....
Propane	7.3	1,170	50.8	20,320	.....	68.0	697,000	18,820	.....	.....
Iso-butane	7.0	1,140	13.0	5,200	.....	12.8	131,800	4,310	11.1	2,434
N-butane	23.8	3,870	24.5	9,800	.....	10.6	102,000	3,250	37.2	8,140
Iso-pentane	15.3	2,500	4.3	1,720	.....	.....	.....	.....	15.4	3,358
N-pentane	11.5	1,870	3.2	1,280	.....	.....	.....	.....	11.7	2,566
Hexanes, plus	35.1	5,700	.....	.....	.....	.....	.....	.....	24.6	5,400
Totals	100.0	16,250	100.0	40,000	.....	100.0	1,026,280	.....	.....	21,921

MATERIAL BALANCE

Hydrocarbon—	Into Column Cu. Ft./24 Hrs.	Out of Column Cu. Ft./ Hrs.	Difference	Per Cent Difference
Methane	16,120	13,380	2,740	17.0
Ethane	69,200	81,100	11,900	17.2
	Gals./24 Hrs	Gals./24 Hrs		
Propane	21,490	18,820	2,670	12.4
	6,340	6,746	406	6.4
N-butane	13,670	11,390	2,280	16.7
Iso-pentane	4,220	3,380	840	19.9
N-pentane	3,150	2,565	585	18.6
Hexanes plus	5,700	5,400	300	5.3
Average				8.1

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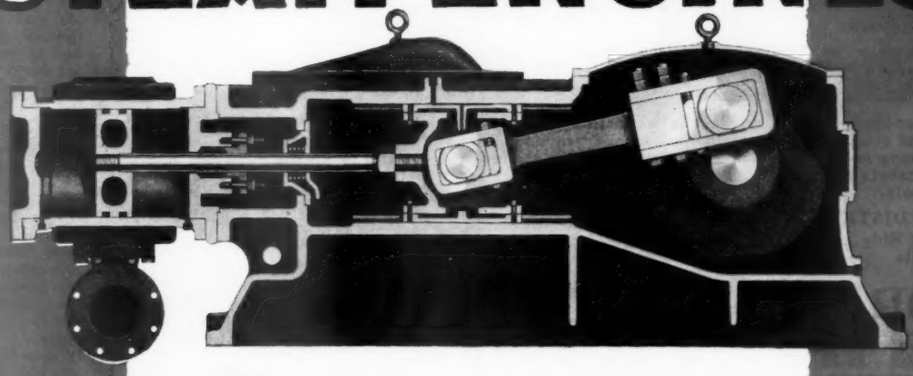

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vapor pressure of the gasoline at the temperature used in the calculations.

Plant Surveys: The most satisfactory way of analyzing the performance of a gasoline plant is to take the proper samples and data to make a complete material balance for the amounts of individual hydrocarbons entering and leaving the plant. In the first place, the balancing of the amounts of methane, ethane, propane, etc., whether in cubic feet or gallons entering the plant in the wet gas, against their total amounts in the discharge gases and in the gasoline product is a severe and conclusive test of the dependability and accuracy of the plant survey. Second, the discrepancies in the individual hydorcarbon balances and in the overall material balance usually indicate wherein the measurements, sampling or analyses were faulty.

Upon critical study of many material plant balances, it was found that usually the analyses are least to blame, and that the most careful attention must be paid to gas and gasoline volume measurements, sampling and careful account of absolutely all material entering and leaving the plant. It should be emphasized here that it is not only possible to make such material balances when using fundamental analysis, but very desirable to do so whenever possible, as such a balance not only furnishes an absolute criterion of the dependability of the test data, but is a powerful tool for the analysis of plant or equipment performance.

Results of Surveys

A number of plant surveys will now be presented to illustrate the use of fundamental analysis and material balances for the analysis of plant performance.

Plant Survey No. 1, Table 3, shows a heavy loss of gasoline in the dry gas discharge from the absorbers, amounting to 714 gallons per day. The assumption that the gasoline content of the gases is equivalent to n-butane and heavier is fairly close for the gases in the particular field where this plant is located, although its use would not necessarily be justified in other fields. Accordingly, the oil circulation was increased and provisions made for lowering the oil temperature. A later plant survey which was made too late for inclusion in this paper, indicated a substantial recovery of the lost gallonage.

Plant Survey No. 2, Table 4, Snap Samples were taken of the various gases and of the gasoline, and the balance accordingly shows considerable discrepancies. Apparently there is less n-butane and heavier leaving the plant than entering which would indicate an inaccuracy in gas or gasoline measurement. As the balances for propane and for iso-butane, which pass out of the plant mostly in gas form, are very satisfactory, the inaccuracy seems to be traced to the measurement of the gasoline volume, especially as the discrepancies in gallons for n-butanes and for pentanes-and-heavier are roughly proportional to the respective gallonages.

The important findings from this survey, however, are the low per cent of [illegible]tanes, only 20.72 per cent, and the [illegible] high per cent of propane, 1.18 per cent in the finished product, and the loss of [illegible] 700 gallons of n-butane and 831 gallons of pentanes-and-heavier in the absorber re[illegible] due. By reducing the propane per cent in the finished product to a few tenths of a per cent, by incorporating more n-bu[illegible]tane to about 30 per cent total butanes permissible for a 90 per cent recovery product, and by raising the oil circulation in the absorbers to save the pen[illegible]tanes-and-heavier, the production could be raised from 10 per cent to 15 per cent. As it happens, this particular plant was already overloaded, and it was not pos[illegible]sible to make the proper changes to bring about the increased production above possible.

Stabilizer Survey: Table 5. This survey is of a low pressure type of stabilizer, the cooling in the top of the column being accomplished by injecting a high octane condensate obtained from a special plant cycle into the top tray, where it flashes and lowers the top tray temperature. Since no pentanes and heavier pass out in the vent gas and no propane in appreciable quantity is retained in the product, the performance of this particular stabilizer is excellent. However, the material balance over the stabilizer shows a high average error per cent, 8.3 per cent, pointing to a faulty volume measurement.

Care in Sampling

It is apparent from the above surveys that to obtain a satisfactory material balance, it is necessary to observe the greatest care in sampling and in obtaining accurate data on gas and liquid volumes entering the calculations. On the other hand, considering the complexity of the natural gas and gasoline mixtures, the multiplicity of processes to which they are subjected in the plant, the inconstancy of wet gas composition and of operating conditions in the natural gasoline plant, and the susceptibility of natural gas and gasoline to change of composition upon the least change in conditions, it is surprising that a material balance of this kind can be obtained at all, and the above surveys are to be regarded as a distinct step forward in the progress of the natural gasoline industry, all the more since they represent a new co-operation among petroleum companies to freely offer data of this kind for discussion and for publication.

Apart from its uses as illustrated above, fundamental analysis has served to introduce and make possible the calculation of composition changes of natural gas and gasoline occurring in condensation or vaporization processes as in condensers, compressors, stills, oil absorption towers, stabilizers, etc., whether this change be in one step as in the flashing of a reflux liquid into the top tray

TABLE 6—COMPUTATION OF VAPOR PRESSURES FROM GAS AND GASOLINE ANALYSES

Data: Testimony Suit in Equity, Carbide & C. C. Co. vs. Phillips Petroleum Co. Equilibrium Assumed. Temp. 80° F. Actual Pressure 137.7-lbs. Per Sq. In. Abs.

Vol. I P. 104. Sample S-7
"Vapor from High Stage Recompressor"

	By Vol. %			
Methane & Air	11.1	$\frac{11.1}{3000}$	=	.0037
Ethane	16.0	$\frac{16.0}{608}$	=	.0263
Propane	43.5	$\frac{43.5}{152.5}$	=	.2852
Butane	14.1	$\frac{14.1}{36.2}$	=	.3895
Pentane and heavier	0.2	$\frac{0.2}{10.6}$	=	.0189
Totals	100.0			.7236

Vap. Press. = $\frac{100}{.7236}$ = 138.2-lb. Sq. In. Abs.

Vol.I P. 104. Sample S-4
"Liquid from High Stage Recompressor"

	By Wt. %				
Ethane	0.7	$\frac{0.7}{16.03}$	=	.0437	$\frac{.0437\times608}{1.8160}$ = 14.62
Propane	27.4	$\frac{27.4}{44.06}$	=	.6218	$\frac{.6218\times152.5}{1.8160}$ = 52.22
Butane	45.8	$\frac{45.8}{58.08}$	=	.7885	$\frac{.7885\times36.2}{1.8160}$ = 15.89
Pentane and heavier	26.1	$\frac{26.1}{72.1}$	=	.3620	$\frac{.362\times10.6}{1.8160}$ = 2.11
Totals	100.0				1.8160 V.P. = 84.84 lb per sq. in. Abs.

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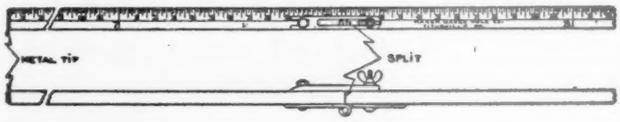

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of a low-pressure stabilizer or semicontinuous as in the numerous plates of an absorber or stabilizer. Such calculation is of inestimable importance in understanding the mechanism of a piece of equipment, and in its scientific design. The difficulties in applying calculation of this kind to equipment were twofold; first, lack of analytical methods to furnish data and checks for the calculations—and, second,—lack of practical methods of calculation themselves.

Practically all theoretical treatises and articles on the calculation of distillation and vaporization problems have been restricted to the consideration of binary mixtures. However, even a ternary mixture is radically different from a binary mixture as regards its behavior in vaporization processes and as natural gasoline is a mixture of at least 10 actually determined hydrocarbons, the calculations for binary mixtures are quite patently useless to the natural gasoline engineer. On the other hand, what few dissertations on the behavior of complex mixtures are published are dependent upon difficult and involved mathematical formulations, such as equations for vapor pressure curves or for equilibrium vapor-liquid relations and were never really meant for practical use.

The problem before the industry is to develop a simple and comprehensive system of practical yet accurate methods for the calculation of composition changes of natuarl gas and natural gasoline in the vaporization processes ordinarily occurring in the natural gasoline plant. The fundamental principles of all such calculations have been studied and experimentally verified in an investigation by W. L. Podbielniak and George Granger Brown at the University of Michigan, an account of which was presented before the meeting of the American Chamical Society in September, 1928, at Swampscott, Mass., and is also included in Professor Brown's second annual Research Director's Report to the Natural Gasoline Association, as bearing on the problems of its investigation, although not conducted or financed by the association. It has been presented to the Journal of Industrial Engineering Chemistry for publication.

Illustrate Methods

Illustrations of the use of such methods of calculations as proposed will now be offered. Figure 1 shows the calculated and experimentally determined change in composition for a natural gasoline sample progressively vaporized at constant pressure, in the course of the investigation referred to. Figure 2 shows the change in composition for the vapor evolved from this vaporized liquid. It is seen that the agreement is satisfactory for at least all engineering purposes. Figure 3 shows the results of a weathering test conducted for purposes of a patent litigation to show that straight weathering alone may in certain cases produce a low-propane high-butane product.

The similarity in general trend of the curves between this chart and Figure 1, just shown, is close, and it is possible

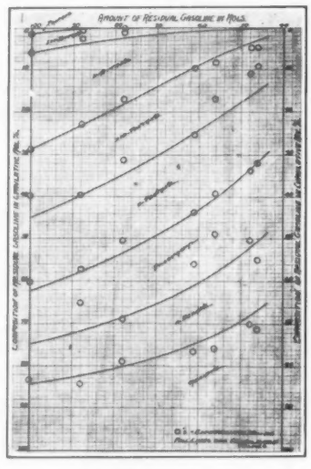

Figure 1.

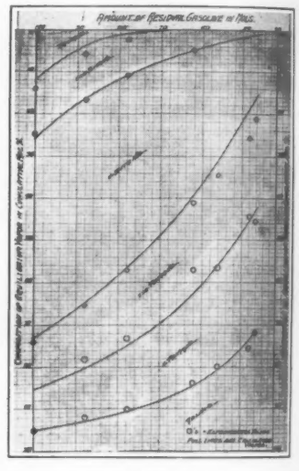

Figure 2.

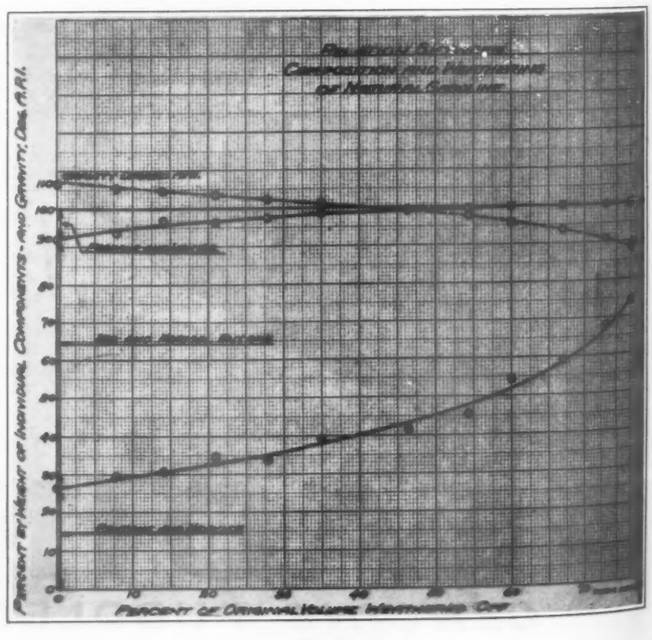

Figure 3.

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to calculate such a weathering test with fair agreement. Since only Raoult's law and material balances are used in such calculation, one of the litigating parties in this case missed a strong argument by showing not only that such a product could be made by weathering but also that the making of such a product could be predicted from simple and well-known physical laws.

A more specific illustration is offered in the following calculation, Table 6 of the pressure in the accumulator of a high stage recompressor from analysis of the vapor and liquid samples taken. The actual pressure in the accumulator was 137.7 pounds per square inch, and the pressure calculated from the vapor analysis was 138.2 pounds per square inch. However, the calculated pressure from liquid analysis was only 84.84 pounds per square inch, showing conclusively that the sample analyzed had weathered appreciably in handling; probably because of its extreme "wildness." The vapor sample was relatively easy to handle at atmospheric pressure without change in composition, and its analysis was checked by this calculation. Similar calculations may be used frequently to check accuracy of sampling and analysis.

As in the case of constants of physical hydorcarbons occurring in natural gas, information on the theory and actual methods of calculation useful in the application of gas and gasoline analysis are scattered throughout the technical literature. The committee has assembled available articles and books bearing directly and indirectly on this topic and a classified bibliography will be found at the end of this paper.

Summary

To summarize the discussion in this paper, fundamental analysis of natural gas and gasoline may be used for the accurate and absolute determination of potential production of products from a wet gas, to determine plant and equipment efficiency, and to analyze plant performance. It is possible and desirable when using fundamental analysis to make close material balances for the individual hydrocarbons entering and leaving equipment or plant in order to determine the dependability and accuracy of the test and to trace the errors involved in the test. Applications of fundamental analysis to plant and equipment surveys and to various calculations made possible by it have been presented. The further application of both fundamental analysis and calculation of composition changes is advised.

REMOVING SULPHUR FROM REFINERY GAS

(Continued from Page 151)

gas per day at a pressure of about 90 pounds, removing 98 per cent of the hydrogen sulphide from a gas containing 400 grains of H_2S per 100 cubic feet.

Mr. Lauriston describes results at the Chatham plant as follows: "The purifying plant has amply justified itself in satisfied customers. The disagreeable odor is eliminated, discoloration of metalware is no longer experienced, and corrosion of stoves, pipes, etc., has been done away with. Modern equipment can now be used in the home—as an example, copper-coil water heaters can now be used. There is also very much less corrosion of the company's own equipment—pipe lines, meters, etc."

Operating Plants

The Gulf Production Co.'s plant is located in Crane County, Texas. Conditions here are unique in that the gas contains a very large amount of hydrogen sulphide, 7,000 grains of H_2S per 100 cubic feet. This plant is at present purifying 310,000 cubic feet of gas per day, removing over 99 per cent of the H_2S, and operates at a pressure of about 20 pounds. In this case, only a small part of the gas is being used for domestic purposes, the principal use being as fuel for gas engines driving direct coupled air compressors. The purification of the gas from hydrogen sulphide ensures long life for the gas engines, pipe lines, etc., and freedom from interruption in operation, due to changing spark plugs, etc. When

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operating on unpurified gas, the power developed by the gas engines was below normal, due to the large content of hydrogen sulphide diluting the fuel. This disadvantage was eliminated by the purification of the gas, resulting in a normal power output by the engines.

In the case of The Texas Company's plant at Port Arthur, the purpose of the liquid purification plant is to prevent severe corrosion in gas compressors, pipe lines, etc., in connection with the compression and transmission of this cracking still gas.

Figure 1 shows views of the liquid purification plant at Wood River, Ill., using the Seaboard Process. This plant is designed for a daily capacity of 6,000,000 cubic feet for gas containing 600 grains H_2S per 100 cubic feet, but the present purification requirements are for about 4,000,000 cubic feet per day, containing 600 to 1,200 grains of H_2S per 100 cubic feet. The liquid purification plant is removing 98 per cent of the hydrogen sulphide, the gas being under 50 to 80 pounds per square inch pressure.

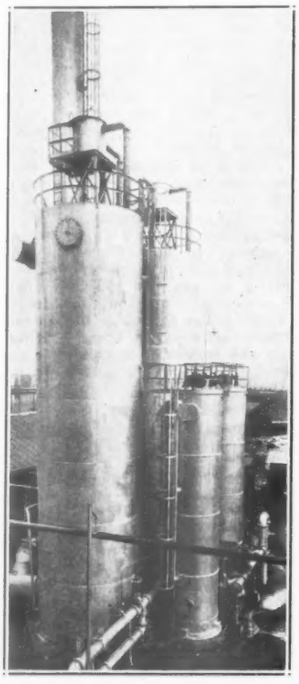

Figure 1—Liquid purification plant of the Illinois-Missouri Pipe Line Co. at Wood River, Ill. Capacity 6,000,000 feet of gas per day.

In this case, the cracking still gas is compressed and purified from hydrogen sulphide by the Seaboard Process, the gasoline is then removed, and the residual gas is piped to St. Louis where it is mixed with water gas and producer gas, the mixture being intended for domestic consumption. The liquid purification plant serves the double purpose of meeting purification requirements of gas for domestic sale and of preventing corrosion troubles in the compression plant and the gasoline recovery plant.

The Seaboard Process as in operation at Wood River, Ill., includes two absorber towers in which the gas is scrubbed by a soda solution to remove the hydrogen sulphide, and two actifier towers in which the foul soda solution is regenerated by a current of air supplied by blowers. The foul air leaving the actifier towers, passes up into a tall stack and is discharged into the atmosphere.

The installation of a liquid purification plant for removal of hydrogen sulphide is a matter well worth the consideration of any natural gas company whose gas contains hydrogen sulphide and of any petroleum refinery whose still gases contain hydrogen sulphide. In every case where such gas is compressed, or where it is used as a fuel for gas engines, or where gasoline is recovered, a

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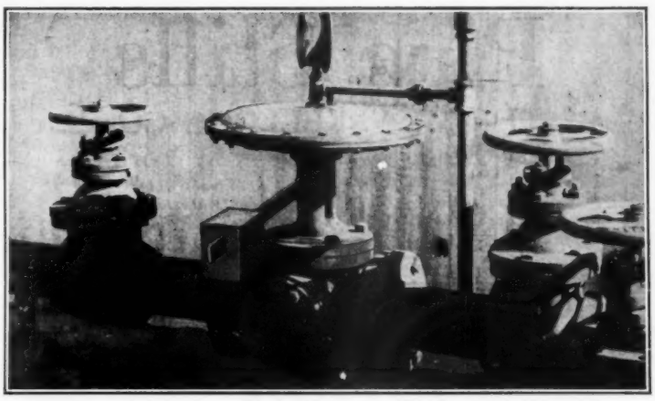

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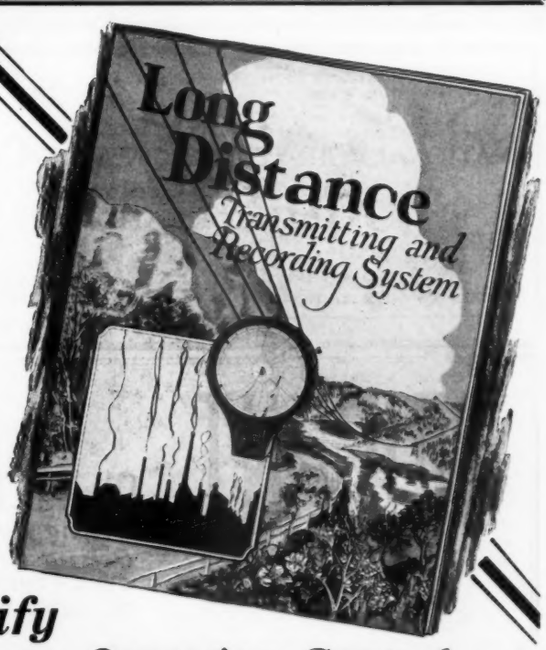

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serious corrosion problem will be solved by the purification plant, and in many cases the removal of the hydrogen sulphide will make it possible to sell the gas, alone or mixed with other types of gas, for domestic and industrial uses.

SUPPLY FOR BUT YEAR IS MUSKEGON OUTLOOK

(Continued from Page 67)

Grand Haven at a special election to be held January 31.

The Grand Haven city council has up the matter of the proposed contract with The Industrial Gas Co. of Michigan to supply natural gas for the municipal water and light plant at 23 cents per 1,000 feet. The plant will use about 850,000 feet of gas a day. The Industrial Gas Co. has contracted for an aggregate daily output of about 2,000,000 feet with a group of the larger industries.

The Eagle-Ottawa Leather Co. is negotiating with the Muskegon Pipe Line Co. to supply about a million feet a day of gas at less than 20 cents per 1,000 feet.

Articles of incorporation of the Muskegon Pipe Line Co. were approved by the Michigan Public Utilities Commission. Officers are: President, R. L. Pattinson; vice president and treasurer, Robert H. Owen; and secretary, James V. Howard, all of Chatham, Ontario, where they are associated with one of the largest gas pipe line companies in Canada.

The company is now supplying the Central Paper Co. with more than 3,000,000 feet of boiler gas a day from one gas well in the Muskegon Field.

The Muskegon city commission granted permission for a fifth pipe line to be laid between the Muskegon Field and the Muskegon plant of the Brunswick-Balke Collender Co., unless the Brunswick company can purchase gas from the Continental Motors Corp. The Brunswick company would use about 2,000,000 feet a day.

The Muskegon Traction Co., which laid the first pipe line to the field, has purchased up to a maximum of 500,000 feet a day of gas from the Balch & Balch No. 1 on the property of the Muskegon County tuberculosis sanitorium. Purchase of gas from this well will give the county its first returns from the oil business.

The Muskegon Pipe Line Co. this week presented a proposed 10-year franchise to furnish North Muskegon with natural gas. This part of Greater Muskegon, in which some of the largest homes are, located, is nearest the oil field and will be the last to receive the benefits of natural gas. The proposed franchise provides a rate of 80 cents per 1,000 for the first 5,000 feet, 50 cents for the next 20,000 and 40 cents for everything over 25,000 feet.

Livingstone County

A pocket of natural gas having a pressure of 10 pounds to the square inch was encountered recently in Howell Township, Livingstone County, near the village of Howell, at a depth of but 165 feet, according to information received here. The new gas pocket was discovered on the farm of J. C. Kinney, on Grand River Road, the main highway between Lansing and Detroit. It is the third gas pocket found in Howell Township by water well drillers.

Two deep test oil wells are now drilling in Livingstone County.

J. C. THOMPSON DIES

Jean C. Thompson, 41 years old, production superintendent for the R. F. Garland oil interests, died at a Tulsa hospital following a 10 days' illness of influenza.

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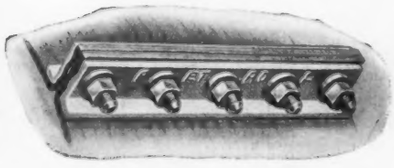

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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS

Pipe Line Statement for November

Runs

Company	Month bbls.	Dly. av. bbls.
*Prairie P. L. Co.	4,500,000	150,000
Gulf P. L. Co.	1,471,222	49,041
Texas P. L. Co.	884,473	29,482
Magnolia P. L. Co.	2,120,315	70,677
Empire P. L. Co.	1,236,637	41,221
Cosden P. L. Co.	879,810	29,327
Sinclair P. L. Co.	3,210,000	107,000
Oklahoma P. L. Co.	3,130,325	104,344
Other lines	7,620,000	254,000
Total November	25,052,782	835,092
Total October	26,499,940	854,835
Difference	1,447,158	19,743

Shipments

†Prairie P. L. Co.	5,461,567	182,052
Gulf P. L. Co.	1,594,937	53,165
Texas P. L. Co.	1,111,436	37,048
Magnolia Pet. Co.	1,995,306	66,510
Empire P. L. Co.	1,035,169	34,506
Cosden P. L. Co.	874,967	29,162
†Sinclair P. L. Co.	3,211,711	107,057
Oklahoma P. L. Co.	3,174,464	105,815
Other lines	7,350,000	245,000
Total November	25,809,577	860,315
Total October	27,333,903	881,735
Difference	1,524,326	21,420

Stocks

	Bbls.
Prairie O. & G. Co.	31,837,000
Prairie P. L. Co.	2,750,000
Gulf P. L. and Gypsy Oil Cos.	10,112,313
The Texas Company	6,762,931
Magnolia Pet. Co.	9,265,632
Empire P. L. Co.	3,875,959
Mid-Continent Pet. Corp.	3,593,914
Sinclair Crude Oil Pur. Co.	20,623,000
Carter Oil Co.	12,128,602
Oklahoma P. L. Co.	3,875,959
Other lines	11,700,000
Total November	116,225,310
Total October	115,173,801
Difference	1,051,509

*Estimated. †Prairie P. L. and Sinclair P. L. shipments include Texas crude oil.

Note—Stocks do not include approximately 8,200,000 bbls. of crude oil held in storage on private tank farms and leases and approximately 210,000 bbls. of Texas Panhandle crude oil in storage in Oklahoma.

EASTERN PIPE LINE REPORT

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for November and December:

	Nov.,'28	Dec.,'28
Nat. Transit	149,632.58	145,961.90
S. W. Pa. P. L.	88,351.54	90,632.07
Eureka P. L.	340,150.08	334,400.38
Buckeye P. L. (Macksburg)	324,323.38	321,746.10
Buckeye P. L. (Cleveland)	9,969.20	11,670.01
Buckeye P. L. (Lima, etc.)	95,741.92	102,544.02
Indiana P. L.	5,045.26	5,869.25
Cumberland P. L.	200,252.82	198,838.68
N. Y. Transit	26,096.56	26,551.67
Tidewater P. L.	213,822.58	222,437.71
Pure Oil	83,222.62	88,231.42
Emery P. L.	59,915.74	62,842.83
Paragon Dev.	21,545.52	21,324.31
Stoll Oil Ref.	8,888.14	9,023.98
Total	1,606,958.54	1,612,774.33
Daily average	53,565.15	52,024.98

Note—Indian Refining Co. also reported other receipts of 247,724.51 bbls. Paragon Refining Co. had other receipts of 194,077.16 bbls. Paragon Development had other receipts of 482.14 bbls.

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio and Kentucky for November and December:

	Nov.,'28	Dec.,'28
Nat. Transit	581,552.73	565,441.11
S. W. Pa. P. L.	453,348.05	472,797.78
Eureka P. L.	233,597.31	218,228.06
Buckeye P. L. (Macksburg)	104,175.67	163,839.57
Buckeye P. L. (Cleveland)	1,942.41	2,189.40
Buckeye P. L. (Lima, etc.)	1,432,776.49	1,389,409.84
Indiana P. L.	1,380,185.20	1,426,008.91
Cumberland P. L.	182,624.70	215,190.79
Southern P. L.	.....	39,859.78
N. Y. Transit	232,023.71	189,477.21
Northern P. L.	240,489.16	173,725.49
Tidewater P. L.	181,613.37	184,601.11
Pure Oil	63,566.49	62,743.21
Emery P. L.	59,668.23	60,747.88
Indian Ref.	159,377.75	195,558.59
Paragon Dev.	.....	21,911.78
Total	5,306,941.28	5,381,735.51
Daily average	176,898.04	173,572.05

Indian Refining Co. reported other deliveries of 339,546.09 bbls.

Gross Stocks

The gross stocks held by various pipe lines in the oil-producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of November and December:

	Nov.,'28	Dec.,'28
Nat. Transit	937,788.09	863,001.46
S. W. Pa. P. L.	548,202.29	429,283.61
Eureka P. L.	1,119,157.14	1,166,151.69
Buckeye P. L. (Macksburg)	565,202.83	558,828.02
Buckeye P. L. (Cleveland)	29,807.45	33,233.92
Buckeye P. L. (Lima, etc.)	2,745,636.88	2,326,759.46
Indiana P. L.	542,471.12	503,036.50
Cumberland P. L.	520,634.29	504,540.79
Southern P. L.	374,083.37	380,167.89
N. Y. Transit	403,009.35	307,858.74
Northern P. L.	381,904.17	367,722.48
Pure Oil	14,711.72	11,641.89
Emery P. L.	12,163.12	13,422.06
Paragon Ref.	22,875.49	21,092.45
Indian Ref.	142,492.29	46,060.23
Paragon Dev.	6,413.78	6,754.88
Total	8,366,553.38	7,539,555.17
Decrease	863,155.73	826,998.21

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of November and December, showing the gross stocks of the above fields:

	Nov.,'28	Dec.,'28
Pennsylvania	3,045,588.44	2,927,780.85
Lima	793,424.06	734,379.46
Kentucky	767,197.74	722,193.76
Mid-Continent	3,695,501.13	3,118,706.55
Illinois	154,842.01	36,469.55
Total	8,366,553.38	7,539,555.17

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1925	1926	1927	1928
January	56,831	55,630	56,209	52,904
February	60,606	60,394	61,298	57,002
March	60,575	61,644	63,124	57,485
April	63,062	63,019	60,337	56,812
May	59,217	60,580	60,284	62,067
June	61,270	61,131	62,757	58,220
July	62,639	63,206	58,674	57,144
August	69,686	61,815	60,870	57,745
September	62,510	64,639	60,285	53,487
October	145,388	161,132	147,036	58,100
November	59,350	61,774	57,275	53,565
December	57,974	58,755	53,089	52,025

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1925	1926	1927	1928
January	157,889	156,056	141,227	146,465
February	160,863	159,488	138,534	167,368
March	154,591	156,239	133,777	158,883
April	151,429	152,371	140,227	172,935
May	146,995	150,998	144,594	180,559
June	149,467	160,257	149,772	188,034
July	161,338	160,045	151,850	189,470
August	161,730	151,929	188,653	192,853
September	156,719	158,915	144,213	194,138
October	145,388	161,132	147,036	176,000
November	143,582	152,608	150,975	176,898
December	150,162	136,428	144,504	173,572

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1926	1927	1928
January	9,859,170	9,718,008	12,276,710
February	9,579,354	10,119,162	12,180,419
March	9,438,292	10,794,044	12,239,725
April	9,805,851	11,112,295	11,740,125
May	9,531,757	11,359,381	11,602,468
June	9,585,904	11,493,673	11,287,678
July	9,734,687	11,458,128	10,819,231
August	9,058,947	11,989,115	10,236,742
September	9,436,732	12,212,716	9,660,910
October	9,269,806	12,047,661	9,229,709
November	9,257,067	11,939,740	8,366,553
December	9,454,512	12,340,297	7,539,555

Franklin Pipe Line Co.

The following table exhibits the condition of the Franklin Pipe Line at the close of business for the months named and not counted in the stocks and averages reported above:

1927—	Runs	Shipments	Stocks
November	2,746.50	2,220.53	31,472.85
December	2,779.86	1,803.69	32,358.72
1928—			
January	1,886.06	2,424.79	31,819.99
February	2,460.14	3,109.34	21,170.79
March	2,578.86	3,540.33	20,209.32
June	3,153.08	2,779.02	17,992.58
July	2,902.50	3,628.02	17,197.06
August	2,874.11	2,350.13	17,721.04
September	2,820.31	5,255.42	15,285.93
October	1,289.93	538.89	17,551.93
November	2,663.53	788.47	19,426.99

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, January 1	2,288,862.42
Runs from wells	558,261.86
Other receipts	403,608.06
Regular deliveries	463,071.25
Other deliveries	364,443.66

The amount of Illinois oil run by the Tidewater Pipe Co. in December was 35,771.14 bbls. Deliveries were 28,446.01 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1927—	Runs	Deliveries
November	605,621.14	415,185.06
December	577,321.25	397,176.07
1928—		
January	561,759.57	434,147.02
February	573,619.78	450,217.81
March	725,250.82	520,595.69
April	526,013.13	448,283.44
May	632,968.64	522,980.51
June	608,552.49	625,007.33
July	612,286.49	565,678.37
August	639,074.85	671,864.02
September	570,307.91	737,293.50
October	626,147.64	626,290.40
November	576,332.88	702,589.93

Tidewater Pipe Co., Ltd., also delivered in December 85,055.56 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

Average bbls. per day—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
June	11,800	.....	23,367	19,700	9,000	63,567	.....	.....	.....	.....	.....	63,567
July	19,807	2,903	8,774	20,419	2,452	54,355	.....	.....	.....	.....	.....	54,355
August	18,161	3,613	27,774	17,677	2,419	69 646	.....	.....	.....	.....	806	70,451
September	11,100	.....	18,967	38,200	6,700	74,967	.....	.....	.....	.....	.....	74,967
October	17,323	.....	11,807	6,483	.....	.....	.....	.....	.....	.....	.....	35,613
November	21,333	5,200	25,400	18,200	7,100	77,233	.....	.....	.....	.....	1,000	78,233

AVERAGE DAILY IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

Average bbls. per day—	Atlantic Ports: Baltimore	Boston	New York	Philadelphia	Others	Total	Gulf Coast Ports: Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
June	24,900	12,233	119,867	41,667	19,300	217,967	1,833	15,567	2,167	.....	19,567	237,534
July	23,484	14,548	111,903	37,678	21,452	209,065	9,355	25,000	.....	774	35,129	244,194
August	25,290	16,323	123,226	21,613	7,194	193,645	.....	38,677	.....	613	39,290	232,935
September	22,933	19,100	110,467	30,700	14,333	197.533	6,367	41,300	6,333	1,667	55,667	253,200
October	20,161	16,839	128,452	27,710	7,098	200.258	.....	32,226	3,065	1,612	36,903	237,161
November	18,400	16,033	133,700	30,267	8,433	206,833	1,333	37,167	4,633	.....	43,133	249,966

GROSS PRODUCTION IN UNITED STATES FOR 12 MONTHS

(In barrels of 42 gallons.)

		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mountains	Eastern Fields	Total
December:	Month	18,938,823	22,208,417	19,840,000	3,427,174	2,962,750	1,927,148	2,400,578	3,219,900	74,924,790
	Daily average	610,930	716,400	640,000	110,554	95,576	62,166	77,438	103,868	2,416,926
January:	Month	19,028,228	20,978,320	20,024,981	3,319,325	2,791,922	1,805,015	2,429,375	3,133,000	73,510,166
	Daily average	613,814	676,720	645,967	107,075	90,061	58,226	78,367	101,064	2,371,296
February:	Month	18,038,469	19,294,426	19,646,488	3,079,837	2,571,575	1,759,606	2,230,887	3,166,000	69,786,838
	Daily average	622,016	665,324	677,431	106,203	88,675	60,676	76,927	109,173	2,406,435
March:	Month	19,118,320	20,162,524	21,466,632	3,379,031	2,687,948	1,871,158	2,401,911	3,522,000	74,609,524
	Daily average	616,720	650,404	692,472	109,001	86,708	60,860	77,481	113,613	2,406,759
April:	Month	18,280,729	19,096,920	21,845,428	3,412,260	2,472,600	1,915,020	2,370,810	3,231,000	72,624,767
	Daily average	609,357	636,564	728,180	113,742	82 420	63,835	79,027	107,700	2,420,826
May:	Month	19,321,866	19,443,355	21,191,561	3,367,809	2,843,847	1,926,036	2,525,043	3,619,000	74,248,517
	Daily average	623,609	627,205	683,599	108,639	91,737	62,130	81,458	116,742	2,395,113
June:	Month	19,164,244	18,482,981	19,802,520	3,202,050	3,075,911	2,112,149	2,426,470	3,394,000	71,659,325
	Daily average	638,808	616,099	660,084	106,735	102,530	70,405	80,849	113,133	2,388,644
July:	Month	19,754,458	18,809,498	22,155,335	3,171,548	2,792,139	2,237,738	2,492,586	3,472,000	74,885,302
	Daily average	637,241	606,758	714,688	102,308	90,069	72,185	80,406	112,000	2,415,655
August:	Month	19,444,849	20,840,494	22,201,257	3,147,058	2,711,787	2,221,677	2,561,840	3,571,200	76,700,213
	Daily average	627,255	672,274	716,170	101,518	87,477	71,667	82,640	115,200	2,474,200
September:	Month	18,908,169	22,456,860	21,554,260	3,047,250	2,640,070	1,839,625	2,432,430	3,420,000	76,138,664
	Daily average	630,272	748,562	718,475	101,575	84,669	60,987	81,081	114,000	2,539,621
October:	Month	19,430,992	23,431,071	21,522,029	3,058,660	2,652,484	1,836,192	2,571,822	3,612,000	78,115,350
	Daily average	626,806	755,841	694,259	98,660	85,564	59,232	92,962	116,516	2,519,849
November:	Month	19,907,520	22,078,680	20,813,230	2,976,840	2,476,080	1,785,090	2,388,390	3,255,000	75,650,880
	Daily average	663,584	735,956	693,770	99,228	82,536	59,503	79,613	108,500	2,521,696
	Total 12 months	229,316,707	247,283,546	252,062,730	38,588,892	32,579,113	23,226,456	29,231,142	40,615,100	892,903,686
	Daily average	626,548	675,638	688,696	105,434	89,014	63,460	79,866	110,973	2,438,855